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BY
H. A. T. FAIRBANK, D.S.O., O.B.E., M.S., ETC.,
SENIOR ORTHOPAEDIC SURGEON TO KING'S COLLEGE HOSPITAL; SURGEON TO THE HOSPITAL FOR SICK CHILDREN, GREAT ORMOND STREET.

THE surgical treatment of poliomyelitis includes a great deal which can be carried out by any practitioner, whether physician, surgeon, or both.

It is customary for purposes of treatment to divide the course of a case into three stages: the early, acute stage, which lasts while there is pain and tenderness in the muscles; the second or convalescent stage, during which the recovery of power is taking place—it lasts to the end of the first and sometimes the end of the second year; and the third stage, which begins after the lapse of two years: until this stage all reconstructive surgery is delayed.

FIRST STAGE.

During the first stage the spinal cord is the seat of a haemorrhagic inflammation, which is gradually subsiding. Those anterior horn cells which have been only temporarily thrown out of action gradually return to health and perform their normal functions, while others which have been damaged too severely to recover degenerate. The flaccid paralysis affects a more or less wide range of muscles—very often a much wider range than would be suspected from an examination of the patient a few months later.

Unfortunately we cannot tell at first which muscles will recover rapidly, which will recover more or less completely though slowly, and which will remain completely paralysed. Therefore we must treat all the muscles alike until such time as recovery indicates which require special care.

The first essential of treatment is rest, both for the spinal cord and the affected muscles. All patients are best kept in bed for a time; Batten[1] insisted on three weeks, even in mild cases. Steps should be taken to provide absolute rest for all the affected muscles, and this involves rest for all their opponents as well should these not be paralysed. There seems to be a great tendency to delay doing anything, particularly in a bad case, until the acute stage has passed off. This is, I think, a mistake. Splints or other fixation apparatus should be applied at the earliest possible moment, the limbs being fixed in the neutral position. Without fixation deformities are certain to occur. The apophthegm, "Prevention is better than cure," applies with as much force in this instance as in any other. The neutral position is one in which, as far as possible, no one muscle or group of muscles around a joint is favoured to the detriment of others. Thus the foot is put at a right angle, the knees are straight, the hips are straight and the spine flat. The position of the hip and knee joints can be assured by rest on a flat bed, with a towel and a couple of sandbags to keep the knee from flexing, but the feet require some simple splint of tin, wood or plaster-of-Paris to hold them at the right angle. As regards the arm, the best position is one of abduction of the shoulder, flexion of the elbow to a right angle, supination of the forearm and dorsiflexion of the wrist. This position is not entirely governed by a desire to find the neutral position, but partly with an eye to favouring those muscles which we know recover with difficulty, and of which the recovery is more important than that of their opponents; for instance, the deltoid, biceps, etc. This position can be retained by sandbags while the patient is lying flat, but a splint is necessary as soon as he sits or stands. The simplest splint is one made of tin. Such splints serve a double purpose—to give rest and to prevent deformity.

As regards the correction of deformity at this stage, it will be found easy to stretch contracted muscles. When the muscles are still tender, except in cases where this tenderness is unduly prolonged, very gentle persuasive manipulations with fixation on a splint which is slightly altered in shape each day will achieve correction of the deformity. The stretching is painful, and must be done with the greatest gentleness; if the foot is fixed in the position which is the best possible one day, it will usually be found possible to improve this slightly the next.

Lovett and Richardson,[2] in 604 cases, found that in 49 per cent. the pain and tenderness had disappeared by the end of the second week, and in a further 13 per cent. by the end of the fourth week, and that it was quite exceptional to find any tenderness after the second month.

Massage should be carried out with the greatest gentleness, and one must be guided by its effect in each case. If the patient cannot stand even gentle massage, it must be discontinued. Lovett[3] considers it harmful, as since it is painful it irritates an already inflamed cord, and he forbids it absolutely while there is tenderness. In the majority of cases, if done properly, it should not be painful and can do no harm, and it unquestionably prevents some of the wasting of the muscles. Electricity is useless at this stage.

A word of caution seems to be called for with regard to the spinal muscles. There are undoubtedly cases which develop a spinal curve while still lying flat on the back, the position they have been in since the onset of the disease; there are others in which the onset of lateral curvature has been less rapid, but in which a distinct cause is present in the unequal affection or recovery of the muscles of the two sides of the body, or of the two legs, etc.; but there are some cases of scoliosis seen at a later stage which make one wonder whether they ought not to have been prevented. In such cases a special cause for the deformity is absent, all portions of the erector spinae acting well. One cannot exclude unequal power in the two erectores spinae as the cause, but this could equally well have resulted from the stretching of the muscles on the convex side of the curve and relaxation of those on the concave side—that is, it is the result and not the cause of the curvature. A case in which the spinal muscles, though slightly affected at first, have recovered, but still remain weak when the child first begins to sit up, is just the subject for scoliosis. I would urge the advisability of raising the child to a sitting position slowly and gradually by means of a bed rest and pillows. The spinal muscles should be massaged, and any paresis and tendency to curvature looked for.

The possible causes of scoliosis in poliomyelitis cases are:

1. Paralysis or weakness of (*a*) the spinal muscles on one side; (*b*) the abdominal muscles in one loin, and of the intercostals on one side; (*c*) of one psoas (as first suggested by Elmslie).
2. General weakness of all the spinal and accessory muscles.
3. Contracture of one hip.
4. Shortness of one leg.
5. Paralysis of one shoulder.

SECOND STAGE.

There is no question that signs of recovery may appear in muscles previously paralysed up to the end of the first year. In a case treated well throughout, a muscle which is absolutely paralysed after twelve months must be regarded as hopeless (Jones).[4] During the second year further recovery may take place in all those which have to some extent recovered, but a muscle which remains paralysed for many months before showing any return of power will never be of much use to the patient.

The treatment during the second stage comprises the following: Keeping the part warm, relaxation of the paralysed or weak muscles, massage and re-education of muscles, to which must be added "correction of deformity," if such has been allowed to occur. Additional covering for a paralysed limb is essential even in the summer months. The difference in power of a cold and a warm muscle is surprising.

The next point is, in my opinion, the most important. Without adequate support recovery is bound to be far from complete, and will be coupled with deformity. Unfortunately the efficient use of splints is a factor in treatment most often neglected. It is not at all uncommon to find a patient in whom deformities have occurred provided with beautiful walking apparatus, but the use of night splints has been omitted. Splints are more efficient correctors of a tendency to deformity than any walking

*Delivered at the Hospital for Sick Children, Great Ormond Street, on October 28th, 1920.

apparatus. Thanks largely to Sir Robert Jones's repeated utterances on this subject, it is now generally agreed that avoidance of over-stretching of a paralysed muscle, particularly in the early stages of its recovery, is essential for good recovery. The wisdom or necessity of carrying this to the extent of never for an instant allowing any paralysed or weak muscle to be stretched even to a moderate degree, has been questioned by Langley.[5] Whether this prevention of over-stretching should be carried to the extent of absolute relaxation—or, in other words, whether the neutral position is sufficient—or whether the limb should be put in a position to relax the paralysed muscles at the expense of their unparalysed opponents, is still an open question. If all the muscles of a limb are paralysed, the neutral position is, of course, the correct one; but supposing the anterior tibial group paralysed, and the tendo Achillis muscles acting, there is a strong tendency to equinus, and I think the best position is one of slight calcaneus, for a certain amount of slipping of bandages can then occur without the foot dropping beyond a right angle. Moreover, we not only want to see power returning in the anterior muscles, but we want to see equilibrium established between the anterior and posterior muscles at the earliest possible moment, so that apparatus may be gradually discarded. Some weakening by over-stretching of the opponents, therefore, is not altogether a bad thing in such a case.

One word of warning must be given as to the bandages or straps used to hold a limb in a splint. In the case of the leg these should encircle the foot and ankle and, at most, the lower third of the leg; the muscles themselves should be free of all pressure.

The splints must be left on day and night, and removed only for washing, massage, etc., when the position of the limb should be maintained by the hand of the attendant so long as any marked degree of weakness persists. The different methods of fixation for different parts of the body will be referred to later. As soon as recovery has progressed sufficiently walking should be encouraged, suitable apparatus being employed. So important do I consider the fixation of the part and the relaxation of the paralysed muscles that in certain difficult cases where the supervision of splints, etc., has been most inadequate I have applied an irremovable plaster-of-Paris case, with gratifying results; on removal of the plaster a month or two later, a muscle which had previously shown no flicker of voluntary power has been found acting strongly. This method may be used with advantage in cases other than poliomyelitis, where one muscle or group of muscles has been weakened or paralysed by persistent over stretching.

Re-education of Muscles.

This is a term of which we have heard much in recent years, but it means nothing more than exercises carried out with a minute regard for the development of individual muscles. Enormous improvements have taken place in this branch of treatment recently as the result of medical men giving careful attention to the subject instead of leaving the cases to masseuses. W. Colin Mackenzie's[6] name will always be associated with this work. Mackay[7] recently published an excellent paper on infantile paralysis, from the point of view particularly of splinting and re-education. There is no doubt that active exercises are the best means of increasing the power of a weak muscle, provided that muscle has recovered sufficiently to contract voluntarily. Massage may improve nutrition, and more particularly check malnutrition, but it cannot cause a muscle to hypertrophy; alternate contraction and relaxation repeated over and over again can alone accomplish this. Normal voluntary contraction is always to be preferred, though electrical stimulation, when applicable, comes next in usefulness because it produces contraction.

A very important point always to keep in mind in the re-education of muscle is to make the load proportionate to the power of the muscle. It is worse than useless to try and make a partially recovered but very weak muscle produce a movement against the force of gravity. To put gravity out of court the limb is placed so that the muscles to be exercised move the part in a horizontal plane. To make it easier for this movement to be performed with the limb resting, the latter is often placed on a board sprinkled with powder to make it slippery. By this and other means the patient is induced to contract even the weakest muscles over which he has any control. Fatigue is to be avoided at all costs, therefore constant skilled attention during the performance of exercises is essential.

Recovery can take place, particularly when the damage is slight, without any special treatment in the way of re-education, and this without deformity, provided splints have been employed, but without splints anything approaching perfection is impossible.

Massage should be continued with slightly greater vigour, but it is always well to keep in mind, as Sir Robert Jones[8] has pointed out, that a paralysed muscle may be damaged by heavy manipulation. If a tendency to deformity in any one direction is present, the foot should be manipulated in the opposite direction so as to prevent the occurrence of contractures. This is a most important detail, and should be carried out morning and evening by the nurse or attendant. It is often asked after one, two, or more years have passed since the onset of the disease, "Is it any good going on with massage?" My reply is, "The more that limb is massaged, the more it is exercised, and the greater the care taken in keeping it warm, the less will it lag behind its fellow in growth, and the smaller will be the increase in the 'shortening' as the child grows up."

As regards electrical treatment, we must remember that there is a great deal of difference between a child with poliomyelitis and an adult with, say, a musculo-spiral paresis. In the latter it is easy to pick out individual muscles, and, moreover, the patient will readily stand the discomfort of the treatment, whereas in a child a stronger current is necessary to penetrate the relatively thicker layer of skin and fat overlying the shrunken muscles, so that a stimulus sufficient to cause contraction is too painful to be borne by the child; as Batten[9] insisted, such a current usually causes contraction of the healthy opponents, and results in stretching rather than in active shortening of the muscles we are attempting to treat. In older children—and children vary considerably in how much they feel the faradic current—this method should be employed when practicable. In the majority of cases it will be found more worry than it is worth. This holds good for both the galvanic and the faradic currents. As regards other forms of electrical treatment, I must confess myself sceptical. Whether an electric bath with a uniform current passing through it does more than stimulate the skin I am very doubtful. As a means of diagnosis the faradic current is useful; it confirms our clinical diagnosis as to which muscles are really paralysed.

Deformities.

The causes of deformity are gravity and the inability of a weak or paralysed group of muscles to elongate their opponents after the latter have contracted. These two causes may work together or separately. A deformity becomes fixed, that is, incorrectible by ordinary manipulation, as the result of contracture of unparalysed or stronger muscles; after a time there will be in addition accommodative changes in the ligaments, bones, etc. Contracture of the muscle is due to the shrinking of the areolar fibrous tissue which binds the fasciculi together into an anatomical muscle. If this is not stretched in the normal way by contraction of opponents or by daily manipulations, it becomes permanently short and elongation is impossible.

It is, perhaps, not generally recognized that a totally paralysed muscle in poliomyelitis cannot become contractured, and that contracture of a muscle is proof of some, though perhaps not very obvious, recovery of tone in that muscle. As an example, equinus does not result when all the muscles below the knee are paralysed, even though the foot has been unsupported by a splint; in such a case flail ankle results. If any shortening of the tendo Achillis muscles is present there must be some return of power in the calf which should be capable of further development, though possibly not to the extent of being useful to the patient.

It sometimes happens that one muscle around a joint will recover sufficiently to be a strong factor towards the development of deformity, but being alone, or at the most having one adjacent muscle acting, it is impossible to make use of that power for the good of the patient. In other words, that muscle is a good deal more worry than it is worth. In such a case we may be driven to throwing the muscle out of action altogether by excision of a large piece of its tendon. The only other alternative is to transplant the tendon to a position where its power will be

harmless even if not particularly useful. As an example we may take the case of the biceps femoris surrounded by paralysed muscles and causing the triple deformity of flexion, valgum, and external rotation at the knee-joint. The tendon may be transferred to the front of the joint to take the place of the quadriceps, but I have yet to see the case where it has become an efficient extensor of the knee.

As already stated, operative treatment during the second stage should be confined to the correction of deformities; they are bound to get worse if untreated, and so long as they are present, muscles which may have a potential power of recovery are being ruined by overstretching.

The operative procedures are practically limited to tenotomies, fasciotomies, wrenching and tendon lengthenings. The latter is preferable in the bigger tendons; in the tendo Achillis, for instance, the Z method should be employed, and it matters little whether this is done by the open or the subcutaneous procedure. Sufficient lengthening of the tendon will be obtained, without undue elongation and resulting loss of power, if the tendon is allowed to unite with the foot at a right angle. I prefer the open method, particularly when the recovery is fairly evenly distributed in the muscles below the knee; it is more accurate, and the ends of the tendon can be sutured so as just to allow the foot to be brought to the right angle before the calf muscles are pulled on. The foot should then be dropped a little and held in this position for a few days, then gradually brought to a right angle and kept there. Walking should not be permitted for six weeks.

Having corrected deformities, the parts should be retained in the over-corrected position so as to relax as much as possible the weak muscles and stretch the strong, while re-education, massage, etc., are carried on vigorously.

Genu Valgum.

A not uncommon deformity at the knee, already referred to, due to the pull of the biceps muscle which has alone recovered, or has recovered to a greater extent than the rest of the muscles about the joint, is a triple one—a combination of genu valgum, flexion of the knee, and external rotation of the tibia. The biceps may or may not require lengthening, but in all cases correction must be gradual. I have found a jointed apparatus in which by means of a key the relative position of the two halves of the splint can be altered, of great service. Plaster is applied to the thigh and leg, the apparatus is adjusted to the same angle as the deformity, applied to the plaster, and more plaster bandages added to fix the thigh and leg pieces respectively. By means of the key daily improvement in the position of the joint can be brought about. Osteotomy is not required.

Splints.

For the foot I like a "tin shoe" which is made specially to meet the requirements of the particular deformity present. If the tendency is towards equino-varus, for instance, the sole plate should be above the right angle, should be everted, and should be curved, concave outwards, so that the foot when fixed to it will be in a position of calcaneo-valgus, with the fore part of the foot abducted. A quadrant and screw with a hinge at the ankle may be added when full correction is impossible at first, so that alterations in the splint may be made as the patient improves.

For the knee either a tin shoe with the calf-piece carried up to the buttock or a celluloid splint may be used.

In the hip we usually have to contend against flexion deformity; it is best dealt with by making the child sleep on a double inclined plane bed. This is easily made by putting a firm bolster crosswise beneath the centre of the mattress. Towels and sandbags to keep the knees down will ensure a hyperextended position of the hip-joints, provided these joints are kept at the highest point of the bed. Jones points out that some internal rotation is necessary to ensure stretching of all tissues. If full extension of the joint is impossible, a sandbag may be placed across the lower end of the femur for an hour or two twice a day, while ordinary weight extension is applied to the leg.

For the arm the particular splint used must depend on the distribution of the paralysis, but in many cases the birth palsy splint shown or some modification of it will be found suitable.

For difficult cases, or where economy is necessary, although adequate supervision is available, removable plaster-of-Paris shoes or other splints are useful. Celluloid, which was introduced in the treatment of these cases by the late Dr. Batten,[10] is excellent for some cases, but I think there has been a tendency to use it in unsuitable cases. As usually made for the legs, celluloid splints are most inefficient as holders of the foot and preventers of deformity, though they answer admirably in cases of paralysis about the knee-joint. Personally I use them only in severe cases—that is, where the whole limb is paralysed more or less completely, and where the tendency to deformity of the foot must of necessity be comparatively weak. Experience teaches me that one or two points should be mentioned. Complete correction of deformity is essential before the use of these splints. It is not uncommon to see a celluloid splint made to fit a knee with a definite genu valgum. Secondly, in taking the model, plaster bandages must be carried right up to the top of the thigh or even further, and right to the tip of the toes; it is not uncommon to see the splint reaching only two-thirds of the way up the thigh and ending behind the ball of the foot. Thirdly, the foot must be at a right angle, and kept in this position during the whole of the period of the taking of the cast.

It is impossible to describe in detail walking apparatus for use by day, but a few points may be mentioned. One question that arises in every case with a tendency to drop-foot is whether a toe-elevating spring should be used or only a right angle "back-stop," which means that the joint opposite the ankle is so constructed that dorsiflexion is free, but plantar flexion cannot proceed beyond a right angle. I am inclined to favour the latter, for a spring is either so strong that the calf muscles cannot overcome it at all, and the patient walks on the heel, or the calf muscles are made unduly strong by having to overcome the pull of the spring. This is an undesirable result, as it is equilibrium between the opposing groups of muscles that we are so anxious to obtain.

In paralysis of the glutei muscles it is necessary to have an accumulator acting behind the hip-joint of the iron, to replace the paralysed muscles and retain the patient in an erect position. To get a firm attachment for the accumulator it is necessary to have a celluloid spinal jacket made, and it is also an advantage to have celluloid sheathing pieces for the thighs riveted to the "irons." The jacket can be cut away freely in front and be little more than a back plate, provided that there is no scoliosis.

THIRD STAGE.

We now have to consider the various problems which confront us when further recovery of muscle power is impossible.

Tendon Transplantation.

Orthopaedic surgeons are fairly well agreed upon the general principles which should govern the surgeon in carrying out tendon transplantation. An operation of this description should never be done until at least two years have elapsed since the onset of the disease, and never till any deformity present has been fully over-corrected. To shift a tendon and expect its muscle to correct deformity is bound to lead to disappointment. What we hope to achieve by tendon transplantation is to restore or increase the power of movement in a certain direction, to give stability to the part, and to check a tendency to deformity, and thus to make possible a reduction in the amount of apparatus worn by the patient. Sir Robert Jones,[11] to whom one naturally turns for help in this as in every branch of orthopaedic work, has insisted on the importance of selecting for transplantation tendons of which the muscles have shown definite evidence of very considerable recovery. Transplantation of a muscle which is only just acting is worse than useless.

The transplanted tendon should always be attached subperiosteally or even in a tunnel in the bone whenever this is possible, rather than simply sewn to another tendon. It is not advisable as a rule to shift the attachment of a tendon half-way round the circumference of a limb; particularly is this so when the muscle has a pure action. For instance, good results are not usually obtained by trying to make a pure flexor into an extensor. An operation commonly practised is that of shifting the biceps femoris tendon and inserting it into the patella. I am open to conviction, but I have still to see such a shifted biceps contract alone at will, and produce extension of the

knee-joint. I have seen it contract with the flexors and interfere with the action of its fellows, but this is a very different thing from this muscle producing extension of the knee-joint at the will of the patient. On the other hand, the tibialis anticus is a dorsiflexor of the foot as well as an inverter, and when shifted to the outer side of the foot still acts as a dorsiflexor, and comes into action as such at the will of the patient, but its new attachment makes it combine dorsiflexion with eversion instead of inversion. In such a transplantation we do not rely on re-education of higher centres; hence the success which follows such an operation.

One of the most satisfactory transplantations is insertion of the extensor longus hallucis tendon into the head of the first metatarsal for those cases with a tendency for the ball of the big toe to drop, and for the big and other toes to cock up in the hammer position; more or less valgus is a common accompaniment; the tibialis anticus is usually paralysed, though not always. The line of action of the transplanted tendon is not appreciably altered, and being meant for an elevator of the fore part of the foot, it achieves this object with ease. There is one small addition to the operation as usually performed that I have found useful. The operation is followed by flexion of the terminal phalanx of the big toe, a condition which may be distinctly annoying to the patient, particularly when putting the foot into a boot. To avoid this, I sew the distal cut end of the extensor proprius tendon to the slip from the extensor brevis to the big toe, the terminal joint of the big toe being fully extended. The distal portion of this tendon now acts as a ligament, and prevents the dropping of the terminal phalanx.

Transplantations for paralysis of the upper limb are much less commonly performed. The war provided us with a useful experience in transplantations about the wrist-joint. In the forearm we have a very different problem from that encountered in the foot. In the hand and wrist deliberate, exact, and even fine movements are necessary, whereas in the foot mere stability is necessary, together with the gross movements of dorsiflexion and plantar flexion of the foot. Fortunately the synergic action of muscles about the wrist enables us to select tendons for transplantation which are normally called into action by forced contraction of the muscles which have become paralysed and which we wish to replace; as a result, anything in the way of re-education of higher centres, if this be possible at all, is not required. If the dressings are removed three weeks after operation, the desired movements of the fingers and the thumb can be performed readily, and with suitable treatment these movements rapidly become brisk and strong. Such a result unfortunately is not invariable, and for two reasons: either the muscles selected for operation are not the best, owing to an error of judgement on the part of the surgeon, or because the paralysis has limited the choice, or the technique of the operation is imperfect, the error usually being on the side of laxity of the transplanted and paralysed tendons.

This brings us to the important point of the strain that should be put on a transplanted tendon before it is attached to a bone or other tendon. There are two schools of thought on this subject: one says that the tension of the transplanted muscle should be no more than the normal tension of that muscle when the joint upon which it normally actuates is in the neutral position; whereas the other school says that the graft should be carried out with the tendons as tight as possible. When operating for the relief of peripheral nerve injuries, in which cases the muscles selected for transplantation are healthy, and have as a rule never been paralysed, there is no question that tightness of the tendons at the moment when the sutures are being inserted can alone give satisfactory results. In poliomyelitis, however, the problem is not quite the same; the muscle selected for grafting has almost certainly been paralysed at some time previously, and cannot therefore be expected to stand stretching in the way that a healthy adult muscle can. However, I am now transplanting tendons in cases of poliomyelitis with a much greater strain upon them than I did before the war, and I am convinced that the results are thereby improved.

One more point must be referred to, and that is the necessity for protecting the grafted muscle from undue strain for several months after the operation. This is particularly necessary in the foot, where body weight and gravity play such important parts in the production of deformity. Exercises to develop power in the transplanted muscles should, of course, be carried out after sufficient time has elapsed for firm union of the transplanted tendon to occur at its new insertion.

ARTHRODESIS.

Arthrodesis should never be performed before about nine years of age, and gives better results if even further delayed.

In the shoulder there are two necessary conditions—fair power in the muscles fixing and moving the scapula, and sufficient recovery in the forearm and hand to warrant the operation. The elbow may be kept at a right angle by removal of skin from the front of it.

Arthrodesis of the hip-joint for poliomyelitis seems to me to be very rarely justifiable. The same may be said of the knee-joint. The chance of breaking the leg with the bones imperfectly developed, as they must be in a grossly paralysed limb, must be great; moreover, I think it only fair that the patient should be left to judge for himself whether he would sooner wear apparatus for the rest of his life and be able to bend his knee to sit down, or whether he would prefer a rigid straight leg.

In the ankle arthrodesis gives an excellent result in some cases, but not in all; the result apparently depends on the stability of the subastragaloid and other joints of the foot. If the mid-tarsal joint (Jones)[12] or the subastragaloid joints are fixed in addition, the results are much improved. Whitman's[13] operation, which involves removal of the astragalus and shifting backwards of the foot so that the tibio-fibular mortice embraces the anterior end of the os calcis, gives excellent results in those almost completely paralysed legs. This is a particularly useful operation when calcaneus or calcaneo-valgus is present and tendon transplantation is impracticable or is considered insufficient by itself. The peronei, if acting, should be attached to the os calcis or tendo Achillis, as practised by Whitman.

The results of the insertion of silk to act as ligaments are, I think it may be fairly stated, very uncertain, and the improvement cannot be relied upon to last. As in every branch of surgery, particularly orthopaedic surgery, those who are keenest on, and employ to the greatest extent, a particular method of treatment are those who will get the best results therefrom; but my own experience of this method is that it cannot be relied upon to prevent a relapse of the deformity. The same may be said of tendon fixation, though I am not prepared to deny that both these methods may be of use when combined with tendon transplantation in selected cases. If a hole is bored through an atrophic bone—the tibia, for instance—and through it is passed a strand of silk, the opposite end of which is attached to a bone in the foot and the thread tightened, the weight of the foot, with or without the assistance of the calf muscles, will cause gradual absorption of the hole in the bone under the constant pressure of the silk, so that sooner or later the tightness of the thread eases off and the foot is no longer held in the desired position.

As regards the spine, poliomyelitis provides us with some of the most difficult cases to treat. As Lovett[14] has pointed out, the deformity can begin while the patient is still in bed. In such cases I have found it advisable to use corrective slings pulling horizontally in opposite directions, made of towels or broad strips of flannel and tied to the sides of the bed. In the usual child's cot it is possible to apply these slings without compressing the chest and the abdomen by attaching the two ends of a sling to the upper and lower bars of the side rails respectively.

Tilting of the pelvis may be corrected by a perineal band pulling obliquely upwards on one side, while a weight extension on one leg pulls downwards on the other. Later a plaster bed, moulded to the patient in the slightly over-corrected position, if this position is possible, may be used for sleeping or resting in; while if walking is possible a celluloid jacket, holding the spine in the over-corrected position, may be used. Correction can also gradually be achieved by the use of a plaster bed with pieces of broad webbing stretched across so as to bring pressure to bear on certain spots—for example, the prominent ribs on the convex side of a curve, as first suggested, I believe, by Mr. Openshaw.[15] I prefer to use felt pads in the floor of the bed to serve the same purpose.

In recent years, with the increase of bone grafting, particularly as the result of the pioneer work of Albee, grafts and other methods of bony fixation have been employed for the fixation and prevention of deformity of the spine in these cases. Unquestionably this is a justifiable procedure in selected cases, but many cases are not severe enough, while others are so severe and incorrectible, or are so hopelessly crippled generally, that the operation is unjustifiable. A case with obliquity of the pelvis and lumbar curve due to paralysis of the psoas or abdominal and lumbar muscles on one side, seems to me one in which operative fixation of the spine is worthy of serious consideration in the absence of any contraindications. Again, some severe "*C*" curves which are seen before fixation of the deformity to any great extent has occurred should also be treated by gradual correction as far as possible, with a view to eventual fixation by a bone graft. More is being done along these lines in America than in this country, by Albee[16] and Mackenzie Forbes[17] among others.

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MITRAL STENOSIS, AURICULAR FIBRILLATION, AND THE ACTION OF DIGITALIS.*

BY

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A WRITER in this JOURNAL † recently made the statement: "A clear conception of auricular fibrillation is essential to the management of heart disease." The commonest antecedents of this disorder are mitral stenosis and myocardial degeneration; it also occurs in connexion with arteriosclerosis, aortic and mitral incompetence, and certain acute diseases, as rheumatic fever, pneumonia, diphtheria, and infective endocarditis.

Whatever the cause of the fibrillation it can be most profitably studied in relation with mitral stenosis. If we wish to understand mitral stenosis, as we commonly see it in young adults, we must go back to the rheumatic heart affections of childhood. Our conceptions of rheumatism are apt to be dominated by the occurrence of arthritis. In adults arthritis is the prominent symptom; the heart affection is incidental. In children, on the other hand, the joint signs are often transient, insignificant, or absent, while carditis is very common. I use the word "carditis" advisedly, because pericarditis and endocarditis never occur without myocarditis. It is in children especially that this liability to pan-carditis exists. Murmurs and friction are well known and common signs, but the most striking sign of all, to my mind, indicating involvement of the myocardium, is the accelerated cardiac action which may continue for weeks or months following an attack of rheumatic fever or chorea. These cases need prolonged rest if the cardiac condition is to have time to quiet down. Valvular and muscular lesions are incurable, and the only chance of averting or mitigating their effects is to encourage resolution of the infective process by means of rest.

The structure of the rheumatic nodules on the valves and in the wall of the heart is similar to that of the subcutaneous fibrous nodules occasionally met with. The effect of the nodules on the valves may be rapidly destructive, causing, in the case of the mitral, more or less regurgitation; these cases may end in mitral stenosis from subsequent contraction of the fibrous ring to which the valve segments are attached. But a more common origin of stenosis is the presence in the valve of islets of infection, which lead to a chronic process of sclerosis extending over years. Rheumatism is proverbially relapsing, and knowing its nature we can have no doubt that from time to time extensions of the infection in the heart take place, not necessarily accompanied by arthritis, but gradually leading to a tighter and tighter narrowing of the mitral orifice. Mitral stenosis is commoner in women than in men; chorea is commoner in girls than in boys. Acute observers like Barlow have suggested that the partiality of chorea for the female sex may to some extent explain the frequency of mitral stenosis in women. Chorea, like rheumatism, is notoriously apt to relapse; sometimes a murmur can be heard during an attack, sometimes not. I believe that most, if not all, cases of mitral stenosis are due to sclerosing valvulitis, whether choreic, rheumatic, or merely latent; its destructive effects are slow and insidious; the mitral curtains become thickened, indurated, and adherent at their margins, and it is not realized till years have elapsed that an irremediable narrowing has occurred. This sclerosing process may cause no alteration of the heart sounds till it has been at work a considerable time.

The symptoms and signs of mitral stenosis may be divided into (1) the incipient stage; (2) the stage of full development; (3) the stage of auricular fibrillation. In the first two stages the pulse is regular; in the last it is grossly irregular.

Mitral Stenosis: Early Signs.

The first stage causes no symptoms, hence it will not be recognized unless looked for. Children of known rheumatic history ought to have their hearts examined from time to time, especially at the time of choosing a career. Every patient ought to be examined both in the standing and the recumbent position; a presystolic murmur, not heard in the standing position, will sometimes be brought out if the patient does a little exercise and then lies down. An important early sign is an apparant reduplication of the second sound at the apex. It is not a true reduplication, as the second part of the sound is produced at the mitral and not at the semilunar valves. A real reduplication, heard at the base, is due to asynchronous closure of the sigmoid valves, but is of no importance as an early sign. An apparent doubling of the first sound at the apex may be due to a short and ill-developed presystolic murmur. An instructive case of this kind lately came before our special neurological board for army pensioners:

He was a man, aged 25, who complained of muscular pains and occasional swelling of the ankle-joints. I noticed slight, irregular, jerky movements of the right arm and leg, but as tremors and spasms are very common in this class of case, the significance of the symptom did not at first occur to me. In both standing and lying positions the heart's impulse was slightly forcible, though there was no obvious enlargement; the first sound was rather loud and accompanied by a systolic murmur; the second sound at the apex was reduplicated. At this moment one of my colleagues happened to come into the room and I asked him to confirm the signs. While he was listening he exclaimed: "Why, the man's got chorea!" and so he had plainly enough.

Here we had the three parts of the rheumatic picture pieced together—namely, the muscular and arthritic pains, the heart lesion, and the chorea. These early signs indicate heart disease of at least three years' standing, and the fully developed signs of mitral stenosis indicate disease of five or more years' standing. This man was working as a coal-miner, and illustrates the point of unsuitability of occupation. He was advised first to have treatment from his insurance doctor, and then to change his occupation if possible.

Intermediate and Later Signs.

The fully developed signs of mitral stenosis are so well known that I need only refer briefly to them. A presystolic thrill felt at the apex and terminating with the impulse is almost pathognomonic. The rough presystolic murmur of crescendo character, terminating in a short snapping first sound, and the accentuated pulmonary sound are well known and typical signs. It must be remembered that the murmur is heard over a very limited area—that is, the immediate neighbourhood of the apex; neglect of this fact has sometimes led to failure in diagnosis. The short first sound resembles the second sound in quality, and as the second sound often cannot be heard at the apex care must be taken not to mistake the presystolic murmur for a systolic one, and the first sound for the second. This mistake can be avoided by timing the

* A paper read before the Nottingham Medico-Chirurgical Society, February 16th, 1921.

† Review of *The Mechanism and Graphic Registration of the Heart-beat*. By Dr. T. Lewis. Vol. ii, 1920, p. 166.

murmur with the finger on the carotid pulse. The peculiar sharp first sound can often be heard several inches, even a foot or more, from the patient without the intervention of a stethoscope. The presystolic murmur may totally disappear, but the snap sound will probably remain. I went into the country lately to see a woman, aged 38, whom I had known for years as having a well-marked presystolic murmur. On this occasion the heart was regular and slightly rapid; there was neither murmur nor thrill, but the snap sound was definite and audible without contact with the patient at a distance of two inches. As the left auricle becomes dilated and hypertrophied and the stenosis narrower, the murmur often occupies the whole of the diastole, commencing with an accent shortly after the second sound, then diminishing, and again intensifying in the presystolic period. After auricular fibrillation has set in the diastolic portion of the murmur remains and the presystolic disappears.

This stage may last a varying number of years, the condition may appear to be stationary, and some people would say the valvular lesion was compensated. If the stenosis remain moderate life may be prolonged many years, but the tendency is for the narrowing to increase and for breakdown of one kind or another to occur. A large proportion of persons with mitral stenosis seldom feel well: they are soon fatigued and out of breath; there is generally slight cyanosis; they complain of cold extremities because the warming blood cannot reach these parts in sufficient quantity; they suffer from occasional epistaxis, from bronchitis, dyspepsia, and passive congestion of the viscera. My object is to follow out the effect of mitral stenosis on the heart, and only passing mention can be made of such accidental complications as haemoptysis, infarction of the lungs, embolism of cerebral or other arteries.

Auricular Fibrillation.

In a case of mitral stenosis the auricles may assume a condition of fibrillation in consequence of the natural progress of the disease, or of some sudden violent effort. The auricles have now lost the function of contraction by which they normally drive the blood into the ventricles. By fibrillation is meant an inco-ordinated, tremulous and flickering movement of the muscular wall of the auricles, which is in a state of continual agitation. If I may use an illustration of my own, I should compare the fibrillating auricles to the weak fibrillary twitchings which occur in the muscles of the body when they are undergoing paralysis and atrophy. In both cases weak and isolated contractions are taking place, and in neither case is there any resulting, purposive movement. The ventricles normally receive their contractile impulse from the auricles by means of the auriculo-ventricular bundle of fibres; the weak, rapid and irregular impulses arising in the auricles are reflected in the weak, rapid and irregular pulse—the well-known mitral pulse. This has been called "the perpetually irregular pulse," since it remains irregular as long as the auricles continue to fibrillate. Most other forms of irregularity (for example, that due to premature beats) are either temporary or alternate with periods in which the pulse is regular. The fibrillations of the auricles may amount to as many as 500 a minute; the ventricular rate may be 120, 140, or even 200 in rare cases, so that it is obvious that many of the impulses fail to excite any ventricular contraction. It would not be correct to describe this condition as one of paralysis of the auricles. Indeed, if the auricles were paralysed and merely passive the heart would be better able to carry on its work. The ventricles are worried by the ceaseless stream of weak, rapid and irregular impulses proceeding from the auricles; their contractions are consequently irregular and inefficient, and their period of repose is shortened. This irregular action, combined with structural changes in the muscular wall, is a common cause of heart failure, as we see it manifested by dilatation of the heart, venous engorgement, passive congestion, and oedema. Many of the weak heart-beats cannot be felt by the finger on the pulse, and the only method of correctly ascertaining the real ventricular rate is by auscultation. This rule of ascultation applies to all forms of pulse irregularity, which by this means can often be differentiated from one another. The perpetually irregular pulse is in itself an important sign of auricular fibrillation, but there are also other signs in mitral stenosis cases. The murmur loses its rasping character, becoming softer; it is often purely diastolic, not running up to the first sound when the pauses between the beats are long, but occupying the whole interval when the pauses are short. This diastolic murmur has been mistaken by competent observers for the murmur of aortic incompetence; Mackenzie, to whom we owe the foundation of our modern knowledge of heart disease, was the first to explain the true meaning of the murmur. The first sound often loses its sharp snap and becomes more of a tapping character. The onset of auricular fibrillation may in some cases cause but little discomfort; in others it may give rise to increasing cardiac failure from the first. Sir James Mackenzie states that he has seen many individuals with auricular fibrillation who have led strenuous lives, engaged in hard manual labour, and infers that in them the muscle of the ventricles had not been seriously damaged.

I have stated that in auricular fibrillation the ventricles beat rapidly and irregularly. This is true for the great majority of cases. Occasionally the contractions are slow and regular; this occurs when myocardial disease involves the auriculo-ventricular bundle, causing heart-block, and thus interrupting the passage of impulses from auricle to ventricle.

Proof of the Occurrence of Auricular Fibrillation.

Mackenzie has said that "the discovery of this disorder is the most important yet made in the functional pathology of the heart." Of the many hypotheses put forward to explain the perpetually irregular mitral pulse this is the only clear and unassailable interpretation. After Mackenzie had been engaged for some years in studying tracings from the venous pulse in the neck he noticed fine fibrillary waves in the tracing in certain cases where the wave caused by normal auricular contraction was absent. It is now known that these fine waves are caused by the fibrillating auricles. Dr. Thomas Lewis was the first to demonstrate the occurrence of fibrillation by pointing out the similarity between clinical electro-cardiograms, and similar records taken from animals in which fibrillation had been experimentally induced. Spontaneous fibrillation sometimes occurs in horses, and it was from observation on a horse that Dr. Lewis obtained final proof of the occurrence of this disorder. The animal was rendered unconscious, and in the exposed heart the fibrillating movements were clearly seen. It is thus obvious that the conception of fibrillation is no mere theory devised to explain the irregularity; but that the actual occurrence of this disorder has been definitely proved both by observation and experiment.

The Action of Digitalis.

It has long been known that digitalis slows the heart by prolonging diastole—that is, increasing the resting period. It is the discovery of fibrillation that gives the clue to the reason why digitalis acts so remarkably in some cases, and in others appears to fail. It has a twofold action, slowing the whole heart by stimulating the vagus nerve, and, by a specific influence on the auriculo-ventricular bundle, blocking some of the impulses proceeding from auricles to ventricles. It is thus clear why in many cases where the rhythm is normal and regular but little good results from digitalis, and that a great deal of the benefit derived in auricular fibrillation is due to the blocking of many of the disorderly impulses proceeding from the auricles. In this affection the heart is more susceptible to its influence, and there are times when it acts like a specific. It is more successful in rheumatic than in degenerative cases. Many cases of mitral stenosis, when the pulse is regular, do not require digitalis and are better without it. It should, however, be used whenever there is dilatation, except in acute febrile conditions. After irregularity has set in, whether in the early stages, or in the later ones characterized by oedema and other signs of heart failure, the results are often brilliant.

There are many ways of giving digitalis, but for ordinary purposes the *B.P.* tincture is reliable. It is said to lose its potency when dispensed with water, but I have not found this to be a common occurrence. In auricular fibrillation one drachm of the tincture—that is, ℥x every four hours, or ℥xv every six hours—should be given daily, carefully watching the effect by counting the pulse twice a day by auscultation. After four or five days the heart's rate will begin to fall; in another day or two it will be

between 70 and 80, and then the drug must be left off for a few days. When the heart's beats occur in couples, as is sometimes the case, the drug should be immediately omitted for a few days. Other signs of sufficiency are severe headache, nausea, vomiting, and diarrhoea. Any of these call for suspension of the drug. After a physiological reaction of this description has been obtained, an attempt should be made to find the daily quantity of digitalis which will keep the heart about the normal rate. Patients can take small tonic doses for months without bad effect if they are instructed to omit the medicine for a few days occasionally. The patient's sensations are a good guide as to whether more or less of the drug is required, and some feel best when the heart's rate is kept as low as 50.

In heart failure from purely degenerative changes, in which the pulse frequently remains quite regular, the effects of digitalis are not so good. In these conditions digitalis should be given in the same doses with the same precautions as I have already advised. Mackenzie states* that he has many times attempted to reduce the increased rate of the heart when the rhythm was normal, and invariably failed. This observation certainly applies to all febrile and toxic states. Here the heart muscle is poisoned by the bacillary or other toxin, and digitalis can have no good effect while this condition remains. It may be useful for the resulting heart weakness after elimination of the toxin. Sutherland † obtained reduction of the pulse rate after the temperature had subsided in rheumatic fever. Speaking generally, more good may be anticipated when digitalis slows the heart's action; a longer period of repose is followed by a stronger beat. Cases have been reported in which good resulted although no reduction in rate was obtained.

For pulse irregularities due to premature beats, which commonly cause intermission of the pulse, digitalis should not be given. The drug itself will occasion premature beats, and would certainly aggravate the condition where the tendency already exists. It is not a safe conclusion that because a heart intermits occasionally it is necessarily a weak heart. Digitalis is often wrongly given for supposed "weak heart." Our ideas are certainly clearer than they were ten years ago as to the cases digitalis is likely to relieve and those which it is not.

The paper was illustrated by lantern slides. For some of the subjects I am indebted to Sir James Mackenzie, Dr. Lewis, Dr. Price, and Messrs. Shaw and Sons.

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THE TREATMENT OF SCIATICA BY GALVANIC ACUPUNCTURE.

BY

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THE treatment of sciatica may be comparatively simple or very troublesome. Some mild cases, with rest in bed and sedatives, recover, but in others the whole Pharmacopoeia has no effect, for no known drug has any effect on neuritis or on the absorption of the exudation. Neuritis is usually divided into two types—the parenchymatous and interstitial—no local treatment can have any effect on the former; it is with the interstitial type associated with inflammatory changes in the sheath and connective tissue, and accompanied by exudation of cells, that we are concerned. There is reason for believing that this exudation is distributed not continuously along a nerve but in patches revealed by tender areas or by use of the faradic current. Treatment by acupuncture is particularly serviceable in these cases of nodular fibrositis.

* BRITISH MEDICAL JOURNAL, January 29th, 1921, p. 152.
† Ibid, vol. ii, 1919. p. 50.

Dr. Davis, formerly of Llandrindod Wells, first introduced and described this method in the *Bristol Medico-Chirurgical Journal* in June 1915, but it has been in use for twenty years in hundreds of cases of sciatica and other forms of neuritis.

It is not my intention here to enumerate the different causes of sciatica. I exclude all cases due to pelvic growth, bone disease, spinal cord disease (as locomotor ataxia), diabetes, venereal disease, etc. These have their own special form of treatment, and must be managed on constitutional lines. A definite diagnosis is as important in the treatment of sciatica as in any other ailment, for local treatment of sciatica when there is grave constitutional disturbance is bound to end in failure.

The aim of all the various forms of treatment devised for sciatica is to induce hyperaemia of the nerve. In the Scotch douche and radiant heat an endeavour is made to secure this by the varying stimuli of hot and cold water, or by exposing the whole limb to high temperature. A general hyperaemia of the skin and underlying tissues of the whole of the lower extremity may be obtained, but there is no guarantee that the nerve shares in this hyperaemia—often it does not; at any rate the method is empirical.

By acupuncture the hyperaemia occurs just where it is required, and it can be given in definite doses varying according to the response of the nerve. Again, when an electric current is passed through the tissues sodium hydrate is formed at the negative electrode, which in this case is the needle passed down to the tender spot on the nerve. This sodium hydrate has a caustic action on the tissues. In acupuncture only a small amount of current is used (3 to 6 milliampères) whereas in destruction of a naevus 20 milliampères or more are used. In the case of the naevus a large area has to be destroyed, but in the case of exudation in the nerve sheath the area is very small and the effect should be limited to the exudation. The effect of ionic movement in the tissues is involved also.

From one or all of the above effects it is maintained that by this treatment there is complete relief of pain, but the wasting of muscles with weakness of limb and lameness requires appropriate treatment.

Electrical acupuncture, if carried out according to instructions, is harmless. It must not, of course, be used recklessly with any strength of current, nor must the needle be plunged into any part of the body without consideration of the underlying parts.

Method of Application.

The equipment necessary is:

1. Pantostat or other universal apparatus.
2. Insulated needles of various lengths with platinized points.
3. Holder for needles.
4. Button electrode.
5. Hypodermic syringe and 2 per cent. solution of novocain.
6. Sterilizer.

The sensitive spots along the course of the nerve must be found by means of the faradic current and each one separately treated. An indifferent electrode attached to the positive pole of the faradic current is placed below the knee or on the back. The negative pole is attached to a moistened wash-leather button electrode mounted on a handle.

The buttock is first tested; after turning on the current until the patient just feels it, the button is moved over the surface of the skin until a sensitive spot is touched; this is marked. Two or more of these spots may be found, and the most sensitive is first treated. The easiest way to find the most painful spot is to reduce the current until one or other of the spots is not felt. In neurotic cases it is a good plan to approach the spots from different areas to be quite sure it is properly localized.

The galvanic current is now used. An insulated needle, about 4 in. long, sterilized and attached to a holder, is connected up to the negative pole. The same indifferent electrode is used, now transferred to galvanic current instead of faradic. The skin over the area is painted with iodine and anaesthetized with novocain (2 per cent.). The needle is applied to the chosen spot and the current quietly turned on. I usually begin with about 2 milliampères. The needle is now passed through the skin and deeper tissues and more current applied. It is necessary for the patient to feel something, but it is unnecessary to produce pain. Good results can be obtained in some cases by using 2 milliampères; in other cases 5 or 6 milliampères may be required. If the patient complains of pain, then the strength

of current must be reduced. A reliable guide as to when the needle is in the right place is that the patient states that he experiences the same kind of pain as that of which he complains; the position is then correct and the treatment continued for ten minutes. If not found at first, then the needle must be moved about under the skin until it is. During this ten minutes it may be necessary to increase or diminish the current according to the patient's sensations. After the current has been passing a few minutes the pain often diminishes and the current can be increased. After ten minutes the current is slowly turned off, the needle removed, and the puncture sealed with collodion. No after-treatment is necessary. The spots are treated on alternate days.

It is not possible to say beforehand what strength of current may be required, but the treatment should not be painful. If too much current is used, then considerable pain may be produced and a great deal of reaction follow; the more tender the spot, the less the current. The nerves in different parts of the body vary considerably in the amount of current they take; thus, the nerves of the scalp readily take up to 5 or 6 milliampères and the sciatic and its branches are nearly as tolerant.

The number of spots to be treated in any given case of sciatica varies. There may be only one or two or there may be as many as seven, eight, or nine. The average is about five, but no case must be considered cured until every spot has been treated. This must be done systematically, beginning with the buttock and following down the thigh, front or back, according to the distribution of the pain. Pain around the knee-joint is often troublesome, and spots for this are found about 3 or 4 inches above the patella on one or both sides of the quadriceps extensor tendon. For the pain below the knee, spots are sought for in the calf or front of the leg, also in the latter area for sensory disturbances over the dorsum of the foot.

Acupuncture will not cure the wasting that frequently accompanies long-standing sciatica, and it is important to warn patients of this. The treatment is introduced solely for the relief of pain. For the lameness, and wasting of muscles, the patient must be taught to walk correctly, and massage and electricity are used.

All the failures I have had have been in cases of very long standing in which probably the exudation has become organized or the nerve has been damaged by pressure beyond recovery. It is not possible to recognize these cases beforehand, for many cases of very long standing recover; one case I recall was that of a man of 50, who obtained complete relief of pain, although the nerve was so damaged that his patellar reflex on that side was absent.

The line of treatment described is applicable to any other accessible nerve with suitable modifications. The sciatic nerve is taken as an illustration only; equally successful results can be obtained in any other part of the body.

LIGHT METAL LIMBS IN ABOVE-KNEE AMPUTATIONS.

BY

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THE wooden walls of Old England in their day did excellent service; they were replaced by metal because of its greater efficiency. So it will be with wooden limbs; they will only exist for particular purposes. Among artificial arms that made of duralumin for lightness more than holds its own. For amputations of the thigh above the knee lightness of the artificial limb is essential, for the muscles of the stump are parallel with the bone, and the other muscles which activate it, the ilio-psoas and the glutei, are attached to the end of the femur. Hence the longer the thigh stump the greater the leverage against these muscles, and the shorter the thigh stump the less the leverage. The medium length thigh stumps, 8 to 9 in., are best off. This is seen from Fig. 1. Above this point the gluteal group of muscles begin to abduct the bone, making the man walk badly, often with lurching and the circumduction associated with progression on a peg leg (Fig. 2). This comes on progressively as the muscles are strengthened by exercise and after the fitting of the first limb. These are the two chief points in the mechanism of an artificial limb for the thigh —leverage and abduction.

FIG. 1.—With the amputation at 1 there is little bony leverage to help the muscles. With the amputation at 3 there is much bony leverage against the muscles (like a high-geared machine going uphill). With the amputation at 2 the above two factors are more nearly balanced and the patient is best off.

At a discussion on the subject of re-education of the limbless, admirably introduced by Mr. Muirhead Little, at the Medical Society in March, 1920, the President, Mr. Warren Low, referred to the mental and moral deteriorations which follow the loss of a limb. These are sometimes great and sometimes small, but almost always present in some degree. The nearer to the trunk the amputation is, the greater would seem to be the change. This change is accentuated by the man's temperament and surroundings, being the greater with the larger mentality. To weight and handicap men who have gone through much with a limb which feels "too heavy" and, though their capabilities may be great, exhausts them, is wrong. It is not clear whether these conditions result from the degenerative changes which occur in the central nervous system in association with the loss of the educative value of the limb. To remedy this the amputated man requires the lightest limb, a minimum of hospital life, and a rapid return to work and bright surroundings. At present this can only be obtained by the use of a light metal limb with quick fit, quick instruction and after-care. At present all these factors are lacking. Metal is chosen because in light limbs of wood the wood is so thin that it cracks and constant repairs militate against the original cheapness of the limb. A well-made metal limb needs a minimum of repairs, and thereby soon repays the initial outlay.

Owing to assistance given by the Red Cross and Sir Arthur Stanley, and to the kindness of Colonel Sir Lisle Webb and Sir Charles Kenderdine of the Ministry of Pensions, it has been possible to make experiments at St. Thomas's Hospital on these lines, and it is desirable that the results should be made as widely known as possible, since they bear out in practice all that has been prefaced in theory, and offer considerable hope of improvement to 90–95 per cent. of cases of amputation of the thigh. They are based upon observations made on over one hundred light metal limbs. The results of my experiences are shown in the following extracts.

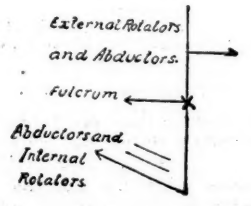

FIG. 2.—As the amputation is done higher and higher up the femur more and more adductors and internal rotators are cut off. The adductors and external rotators are strengthened by the exercise of wearing the artificial limb, and hence its non-fit after a few months' wear. This is more felt by those men of greater mentality. It occurs in the use of both wood and metal limbs and is often shown by the roll of flesh on the inner side of the bucket top.

Reports to Sir Arthur Stanley.

The first point to come out was that, although the (metal) artificial limb gave the *amputé* satisfaction, the metal limb was only a few ounces lighter than specially constructed wooden limbs. The satisfaction could hardly, then, be in the weight. (Light wooden limbs weigh about 5½ lb.; light metal ones 4½ to 5¼ lb.) About 90 to 95 per cent. of men suffering from above-knee amputations are greatly benefited by these limbs.

(*a*) The universal statement is that they can do more work with a fraction of the fatigue.

(*b*) Men supplied with light metal limbs can learn quicker and more than can men with wooden limbs.

(*c*) The special light wooden limbs supplied by the Ministry of Pensions are a distinct improvement on the older type, but break and split more quickly, having reached the limits of what wood is capable. The hybrid limb of wood and metal supplied by the Ministry bids fair to be satisfactory. But it is too early to say much about it.

(*d*) When conscription was introduced into the army all kinds of men were taken into it and some lost their legs. There is no doubt that men fitted with light metal limbs are happier, more useful men, who more easily learn and amongst whom there is a more generally high percentage of physical fitness than there is amongst the wearers of the wooden limbs. They cannot make C3 men A1 men!

Light metal limbs should not at present be given to all, but those to whom they are *not* given should be carefully selected. At least two refused to exchange their wooden limb for a metal one. At least one who has had a light metal limb prefers his wooden one. (He is stated to have had inadequate length of instruction.) Apparently the heavier wooden limbs are more apt to cause pain and necessitate operations than light metal ones, especially when the fit is imperfect.

Apparently the repairs necessary in metal artificial limbs are less frequent—but more difficult and costly—than they are in wooden limbs. This would be lessened in manufacture on a larger scale and would help to compensate for the larger initial outlay.

It is at present doubtful if there is advantage in having the artificial limb less than 4 to 5 lb. in weight, as the lighter the limb the more uncontrollable it becomes. This is not the theoretical statement it is often said to be.

It should be added that one insufficiently instructed man for urgent reasons was allowed to take away a metal limb in the rough, and it gave him so much trouble that he inquired of the Ministry who was responsible for its repairs. Both man and limb were half-fledged.

So much for the theory, the practice, and the immediate results. To ascertain the later results all officers were written to and replies were obtained from a large number. These replies have shown four chief points:

1. Those who had been given and had done well on a heavier wooden limb did most obviously better with metal. They had already shown that they could help themselves, and, supplied with lighter limbs, could do more.
2. A light metal limb should be fitted first of all, so avoiding the delay and learning to use the heavier wooden limb.
3. All men who had previously got about on a heavier wooden limb were for varying times "at sea" with the light metal one before they settled down to steady improvement.
4. The heavier wooden limbs caused far more trouble in painful breaking down and difficult stumps than did light metal ones.

In connexion with 4 it is necessary to say something about the pathology of the stump. The keynote to all the pathology of stumps that are painful and easily break down is the presence of infective inflammation in the tissues. All tissues can be affected. We can see the results in skiagraphs in new-formed bone, and if infective inflammation is found to be present in the bone its presence may be inferred in other structures—nerves, for example. In an amputation nerves must be divided, and being divided they must regenerate. In regenerating it has been shown that they carry down with them the infective inflammation in them, reinfecting and making painful a perhaps merely uneasy stump and producing the late onset of pain. Dr. Urquhart helped much in the bacteriology of these stumps and Colonel Sir Archibald Reid in the skiagraphs. The importance of skiagraphing many stumps that have worn one of the heavier wooden limbs before ordering a second is apparent. Skiagraphy is, in fact, one of the most valuable means there is of examining a stump.

In the concluding part of this paper I will quote what three of these officers say for themselves. There are many more replies which show—

1. That at times the light metal limb is badly made and fitted, requiring repairs (even then less so than wood).
2. Light metal limbs are an inestimable boon to many of those who have had thigh amputations.

CASE I.—H.

Daily Work.—The increased ease with which one gets through one's daily work is maintained.

General Condition.—Continues improved.

Athletic Value.—I am markedly able to get about with greater comfort and speed. I have recently been able to take part in boating, fishing, and shooting, all of which entailed considerable activity, and I was pleased with the way in which the light leg responded.

Stiff Ankle.—This slight obstruction is wearing off, and I hardly notice it as a hindrance now. It is preferable to a movable ankle, saves weight, and gives a bit of a spring off the foot.

CASE II.—R.

I am quite delighted with my light metal limb, and am much better in every respect. You will remember how my stump continually broke down with my heavier wooden,* now I can say I have completely got over all that trouble, which has been a constant source of worry to me. I am getting about much better now, and do not know what it is like to be exhausted. This had a great effect on one generally. My health has improved and my work is more of a pleasure and consequently better, and I am hoping to take up tennis again this summer.

In the early days—I mean 1915-16—when the heavier wooden legs were good and well made, I had a comfortable leg, and got on extremely well and was satisfied as far as heavy legs were concerned, but I must say, with my short experience of a light leg, I wish I had gone in for one at first. It would have saved me a tremendous lot. I am quite convinced that light legs are the thing. I could do most things on a wooden one—dance, tennis, climb about rocks, etc., but at what an expense of energy, and I did too much and got overtired.

This officer hits the nail on the head by writing: "*The whole secret of the light leg is the conservation of energy, and when one is exhausted one's brain is exhausted as well.*"

CASE III.—A.

I have had the light metal limb now for over four weeks, and cannot praise it too highly. Candidly, I never before imagined that an artificial limb could be so useful. My first leg was a wooden one, and, in fairness to Messrs. ——, I liked their limb and its movement, and did very well with it.

As regards distance walking, one evening in London I walked on my wooden leg just over five miles—a good distance on a limb weighing over 9½ lb. (including shoe), but during the last two miles I was decidedly tired and found my foot scraping the ground very often. With my metal limb I have not tried a long distance walk, but feel sure that this distance could be doubled with less fatigue. A brief outline of my day's work will support this. I walk to the office in the morning (one mile). From 9.30 till 5.30 I am on my feet practically all the time; walk home in the evening, and very often later on I walk again perhaps for two, three, or four miles before bedtime. This does not fatigue me in the very least, and I come home feeling I have enjoyed an outing and could have done miles more.

As regards walking quickly I could do this on my wooden limb, but there was a great strain on the shoulders as the knee was controlled therefrom. The metal one has no shoulder control, and to my mind this is not necessary, as by a slight extra jerk of the stump forward speed can be increased at will. Timing myself in the ward when I had my light metal limb in the rough, I found that I did 136 paces to the minute, which, as infantrymen will know, is a very quick march. Walking uphill with the light leg differs very little from walking on the level. With the heavy leg there is a great difference, and it is very fatiguing and slow work. As regards loss of control in strong wind, in my experience the heavy limb is affected to the same degree as the light, and loss of control varies with length of stump. Personally I have had no trouble and have been in some very strong winds during the last few weeks.

To sum up, I think the light metal limb is far and away superior to the heavy, and I consider myself fortunate in possessing one; and I hope the time will come when I can forget that my heavy limb ever existed.

Light metal limbs having succeeded so well in some 90 to 95 per cent. of thigh amputations it was reasonable to try them on below-knee amputations, and this has now been done successfully. The percentage of those improved will be smaller, and it is possible that a better artificial limb may be made for a Syme amputation. It may be to the advantage of the amputated man to have a hybrid limb (wooden socket and metal shin), as tried by the Ministry; at present it is too early to say, but as most serious repairs are required to the sockets it may be doubted if wood should be used there.

* He was sent on from Dover House to St. Thomas's because of this.

AT a meeting, on April 1st, of the West London Medico-Chirurgical Society, with the President, Dr. F. J. McCann, in the chair, a discussion took place on the diagnosis and treatment of colitis, in which were emphasized the importance of sigmoidoscopic examination, the influence of diet as a cause and in the treatment of the condition, bacteriological examination of the faeces and treatment by vaccines, and the influence of climate. Previous to this discussion a number of clinical cases were shown by Mr. Aslett Baldwin, Mr. B. Sangster Simmonds, Mr. Neil Sinclair, Dr. W. N. Goldsmidt, Dr. Clifford Ellingworth, and Dr. W. R. Marshall.

THE PRESSURE IN THE RENAL, PORTAL AND GLOMERULAR CAPILLARIES OF THE FROG'S KIDNEY.

BY

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(From the National Institute for Medical Research.)

(Preliminary Note.)

By making an incision through the skin and abdominal wall in the lumbar region of a urethanized frog and removing the ileum on the same side the kidney is exposed. The cautery is used to stop all haemorrhage. A ligature is tied round the membrane attached to the outer edge of the kidney. By very gentle traction the kidney is then drawn on to the transparent peritoneal membrane which covers a small brass chamber with a glass floor, similar to that used by Roy and Graham Brown in their measurement of capillary pressure in the frog's web. A glass cover is then brought down on to the upper surface of the kidney so that it can be squeezed between the membrane and glass cover when air is blown into the chamber. A water manometer indicates the pressure used for compression. The kidney is examined under the microscope, using a magnification of one hundred times. The kidney appears closely covered with a network of branches of the renal portal vein, through which blood flows slowly in copious streams. On compressing with a pressure of about 2 centimetres of water these vessels are squeezed empty, and the tubules and, in successful preparations, the glomeruli then come into view; the arterial blood is seen rapidly circulating through the glomeruli. The Bowman capsules can be seen surrounding some of the glomeruli, and the glomeruli hanging in a clear space within these. In some glomeruli the afferent and efferent vessels are clearly seen, and the blood corpuscles can be watched racing through the afferent vessel, whirling round the twisted capillaries of the glomerulus and out through the efferent vessel. On the inner edge in one preparation a row of glomeruli were seen fed by the branches of one of the renal arteries.

The pressure required to stop the renal artery and the flow in the glomeruli is of the same order as that in the arteries of the web of the frog's foot—for example, when there has been little loss of blood and the circulation is vigorous, 30 to 40 cm. of water. A pressure of 7 to 9 cm. of water in this case sufficed to modify the flow in the glomerular capillaries, making it a little slower. By increasing the compression the corpuscles in the glomeruli could be driven out, the flow reversing through the afferent vessel. In a kidney in which the blood flow had stopped a pressure of 7 cm. of water sufficed to squeeze blood from the larger vessels through the glomeruli and produce a rapid flow. This preparation of the living frog's kidney seems likely to afford a valuable additional means of studying the renal secretion under various conditions.

A CASE OF COMPLETE PNEUMOTHORAX IN AN INFANT, DUE TO PULMONARY TUBERCULOSIS.

BY

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This case is published for two reasons: First, the condition is extremely uncommon. Secondly, some light is shed as to the probable mode of transmission of the tubercle bacillus to the lungs in childhood in certain cases of pulmonary tuberculosis.

The patient, a boy aged 18 months, was admitted with cyanosis, cough, and dyspnoea, to the wards of the East London Hospital on May 11th, 1920. The history was that he had been in his usual health until three months before, when he contracted measles. Since then he had been in poor health, the chief symptoms being lack of appetite, constipation, wasting, and slight cough. For the last three weeks the cough was decidedly worse; food had frequently been vomited in association with it. The acuteness of symptoms during this latter period had been distinctly accentuated. He had become bluer during the last few days.

Condition on Examination.

On admission the temperature was 102° F., the pulse rate 142, and the respiration rate 40. The child appeared to be extremely ill. Cyanosis was very marked, being especially obvious in the lips and finger-nails.

Examination of the chest gave the following physical signs: Respiratory movement was slightly diminished on the left side, the intercostal spaces on this side appeared to be fuller. Cardiac movements were visible in the fourth space to the right of the sternum. Cyrtometric examination showed the left side of the chest to be the larger by a quarter of an inch. By percussion the heart was found to be displaced two inches to the right. The whole of the left side was hyper-resonant. Over the right side the note was less resonant than normal, the impairment was particularly intense at the right base and less so in the right axilla. The respiratory murmur was very much diminished all over the left side, both back and front. Expiration was prolonged over the right lung in front; in the right axilla the breath sounds were broncho-vesicular. Numerous fine râles were present over the right lung, back and front, especially at the base. No cardiac murmurs were heard.

The liver and spleen were both easily palpable, otherwise no abnormality was discovered in the abdomen. Clubbing of the fingers was not present.

A condition of complete pneumothorax of the left side, associated with bronchopneumonia of the right lung, was diagnosed.

The temperature fell to 98°, the pulse rate rose to 180, and the respiration rate to 70, within the next twelve hours, and the child died.

Post-mortem Examination.

The child appeared to be well nourished. Cyanosis was extreme; the nails of the hands and feet were light-blue in colour. Hypostasis was well marked. The brain was congested, and the subarachnoid in the basal region had a milky appearance; no gross tubercles, however, were seen.

Thorax. — The heart was normal. No pericardial tubercles were found. The left lung was collapsed down upon its root, except at the apex, where it remained adherent to the parietal pleura. The left parietal pleura was studded with miliary tubercles; none were seen on the right side. No excess of pleural fluid was found. The left lung was a solid mass of yellow tubercles. It sank in water. At the apex, where it was adherent to the pleura, a cavity the size of a hazel nut was present. The walls of this were formed by greyish ragged granulation tissue; it was surrounded by an area of extreme caseous change, and its interior communicated by means of a small rent with the left pleural cavity. The right lung was not solid, except in a few small areas. It contained many miliary tubercles. The glands at the hilum of both lungs were slightly enlarged, hyperaemic, but definitely not caseous anywhere.

Abdomen.—No free fluid was present. The liver was seen three inches below the costal margin, and the spleen was also visible. Both were studded with miliary tubercles. Section of the liver showed the presence in its substance of miliary tubercles, some of which were bile-stained. The spleen was adherent to the tender surface of the diaphragm; it, too, had many miliary tubercles within it. Both kidneys showed subcapsular tubercles A few subperitoneal tubercles were found on the walls of the small intestine. The testes were normal. The parietal peritoneum had escaped except where it came into contact with the hepatic and splenic surfaces.

The right knee-joint was normal.

Bibliography.

Cruchet[1] states that of the causes of pneumothorax in children tuberculosis is the least common. He quotes, in addition to his own experience, Lenz, who found tuberculosis in 40 per cent. of his fourteen cases, and Chryanowska, whose figure is 38 per cent. of twelve cases. He states that in the tuberculous cases tuberculous bronchopneumonia was the commonest cause, but that the opening

into the pleural cavity was very rarely observed. Further that the base of the lung was the commonest site of the lesion.

Bovaird[2] collected 18 cases, 4 of which recovered. Particulars of 12 of these cases are available; 5 were associated with bronchopneumonia, and 4 of these with measles in addition; 2 with miliary tuberculosis; 2 with diphtheria and emphysema; 2 with pulmonary abscess; 1 with trauma.

I have found in the literature no other case of complete pneumothorax due to tuberculosis in a child of 18 months.

Pathology.

The probable course run by the disease in the case under survey is well marked out by the *post-mortem* findings. The oldest tuberculous focus found was the collection of very large mesenteric glands, the most recent was represented by the general miliary tuberculosis. Another point shedding great light on the direction of spread was that the left pleural cavity—the one corresponding to the lesion of the pneumothorax—was studded with miliary tubercles, whereas the right cavity was entirely free from them.

The tuberculous disease of the left apex, although fairly recent, was probably of considerably shorter duration than that present in the mesentery, for no caseation was found in the hilum glands of either lung, and the extent of the apical lesion was less than a square inch.

The following reconstruction of the spread of the disease is here tendered:

The exciting cause of active tuberculosis was the attack of measles, and the primary focus of disease was the mesenteric glands. From this origin tubercle bacilli reached the blood stream by way of the abdominal lymphatics, and were carried through the right side of the heart, eventually reaching among other places the apex of the left lung. Those that reached this position flourished and ultimately produced a rapidly caseating area whose territories spread till the left pleural surface was reached. Adhesions were formed here below the two layers of the pleura. During some violent effort of coughing the portion of diseased tissue between a bronchus and the left pleural cavity gave way. The history places this occurrence at three weeks before death. The pleura was severely infected with tuberculous material and became studded with miliary tubercles. As the direct result of this sudden massive infection of a serous surface generalized miliary tuberculosis arose and provided the final scene.

The absence of disease of the pulmonary hilum glands is interesting in view of Canti's observations[3] upon the pulmonary lesions of tuberculosis in children, which suggest that the lung is frequently affected before the glands at its hilum. It seems clear, however, that in this case infection was alimentary and haematogenous, not inspiratory. Unfortunately cultures were not made to prove the class, whether human or bovine, to which the organism present belonged.

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Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

MELAENA NEONATORUM TREATED BY BLOOD TRANSFUSION.

ON February 12th, 1921, I delivered a primipara of an apparently healthy female child weighing 6 lb. During the night the child vomited dark fluid and passed what I supposed to be meconium three times. On the following day the child was very restless and cried considerably. The bowels acted once, the motion still being like meconium. At 1.30 a.m., on February 14th, the baby vomited dark blood, and shortly afterwards passed a large quantity of black, foul-smelling blood from the bowel. Fluids given by the mouth were vomited immediately, and the child appeared to be very ill. At intervals of about two hours alarming quantities of blood were passed from the bowel, and at the same time the child had all the symptoms of a severe haemorrhage; the skin and lips were almost white, the heart beats were too rapid and weak to count, the respirations were sighing, and the eyes half-closed. From the symptoms I concluded that the child would die shortly unless blood transfusion could be performed.

As I myself belong to Group IV (universal donors), I drew from a vein in my left arm 20 c.cm. of blood with an exploring syringe into which I had already drawn 5 grains of sodium citrate in sterile solution. I then exposed a vein in the baby's arm by an incision, and exchanging the large exploring needle of the syringe for a fine hypodermic needle injected the blood into the vein of the baby. It was a matter of extreme difficulty to strike the lumen of so small a vein in a collapsed condition, but I was fortunate in injecting the blood without wasting any. The improvement in the child was immediate and striking. The colour returned to the lips, the respirations slowed down, and the pulse at the groin became palpable. During the next twenty-four hours the bowels acted four times, dark blood being still passed, but in diminishing quantities. On the following day the baby took the breast well and the stools gradually became normal. Since then progress has been uninterrupted and the child is now healthy and with a good colour.

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DIPHTHERIA AND FOLLICULAR TONSILLITIS.

DURING the last ten years in a general practice I have been accustomed to divide all cases of sore throat with exudates into three clinical groups: (1) Those which are plainly diphtheria, with an exudate present on other parts as well as on the tonsils. (2) Those which are plainly follicular tonsillitis. (3) Cases which are doubtful but are probably diphtheria; swabs from these cases yielded practically in all instances the Klebs-Loeffler bacillus.

The number of cases in the last group was small in proportion to the other two, about 5 per cent. of the total. I have observed normal convalescence in the follicular group; that there were only four "dissents" in ten years from the fever hospitals regarding the first group was reassuring. During the later period of the last epidemic, however, I was puzzled by two cases of definite follicular tonsillitis which did not lose the exudate after four or five days, and in each case a swab taken showed, on examination by a pathologist, the Klebs-Loeffler bacillus present. On account of this, swabs were taken from the next ten cases of exudative tonsillitis. In six cases, clinically follicular, the exudate was yellow, soft, pultaceous, in separate patches which did not coalesce and did not spread over the tonsillar boundary; there were no signs of haemorrhage on removing the exudate. In each case there was marked general malaise, a high temperature (102° or more), and pain on swallowing. In four of these six cases the Klebs-Loeffler bacillus was present, which to me was a startling result.

The other four cases were suspiciously like diphtheria; in them the patches of exudate coalesced, and the spread suggested that the exudate would pass beyond the tonsillary boundary. Of these cases, however, three were negative as regards the Klebs-Loeffler bacillus, and one, the worst, was a case of Vincent's angina.

These results raise in my mind one or two questions. Do epidemics of diphtheria differ as to their clinical manifestations? If not, why were the clinical tests I have been accustomed to apply in former years useless in these cases? Is it not extremely likely that the epidemics are caused by cases so plainly follicular, as far as clinical examination can go, that no swab is ever taken? In the face of the facts given above, is it safe for the general practitioner ever to rely on the clinical signs, however definite, in cases of sore throats with exudates, to give an answer to the question of whether a case is diphtheria or not? I for one, after this experience, will never feel that I can rely on the differential diagnosis by clinical signs.

London, S.W. W. H. PALMER, M.B., B.S.Lond.

BRADYCARDIA.

THE following case may be of interest on account of its long duration. We first saw W. W., the patient, fifteen years ago, when he was 70 years of age and was employed as a blacksmith. He complained of attacks of unconsciousness suddenly coming on while at work. These

attacks lasted for about five minutes, and occurred several times during the course of a day. The patient's pulse rate was then 37 a minute, and the attacks were evidently an instance of the Stokes-Adams syndrome. As a result of prolonged rest gradual improvement took place in his general health, and the attacks became much less frequent and finally ceased. During the whole period, however, the pulse rate gradually slowed down to about 25. The previous medical history reveals no illnesses. The patient's general health is now good, but a double senile cataract prevents him from walking much out of doors. In regard to his cardio-vascular system the pulse rate is 25 per minute at the radial artery and at the apex, and the pulse is quite regular. The arteries are extremely calcareous. The apex beat is in the fifth space, ½-inch outside the nipple line. There is no enlargement of the heart to the right. Harsh systolic murmurs are heard at the apex and the base of the heart. There is no oedema. The other systems show no evident abnormality. We have been unable to have a polygraphic tracing taken, but we consider the case to be one of heart-block.

H. C. WOODHOUSE, M.B.,
Dawley, Salop. F. CARLTON JONES, M.B., M.R.C.S.

TREATMENT OF LOCAL LEISHMANIASIS.

I WAS interested to note the short paragraph by Dr. Norman Gray (March 12th, page 382).

As bacteriologist to one of the large British hospita's in Basra I had an opportunity of studying hundreds of cases of "Baghdad boils." I entirely disagree with the statement that scraping is the best treatment for the infection.

We had tried every possible form of treatment, including scraping, with varying success, but found that the only satisfactory treatment was a full pastille dose of *x* rays. Previous *x*-ray treatment had always been disappointing, because, as was pointed out by Major Norman in a War Office Memo. in 1918, the rays had been given in successive small doses. After a full dose rarely was a second dose after four weeks necessary. Healing took place within ten days, and—more important still—one did not have the prominent "bluish" cicatrization which is a feature of all other forms of treatment.

G. F. MITCHELL, M.B.,
London. Late Pathologist 40th British General Hospital.

Reports of Societies.

EXAMINATION BEFORE ANAESTHETIZATION.

AT a meeting of the Section of Anaesthetics of the Royal Society of Medicine on March 5th, with Dr. H. J. SHIRLEY, President, in the chair, Dr. R. W. APPERLEY read a paper on the importance of the examination of patients by the anaesthetist previous to the administration of anaesthetics. He pointed out that improvements in anaesthesia during the last fifteen years had been not in the increased number of drugs at our disposal but in the variety of more scientific methods of administering them. This placed on the anaesthetist an increased responsibility in his choice of method. There was still room for improvement both in diminishing fatalities and in reducing after-effects, and one step towards this lay in thorough examination of patients some time before operation. The condition of the cardio-vascular, respiratory, and nervous systems could only be ascertained in this way, as well as the efficiency or otherwise of the kidneys. Previous examination gave the anaesthetist time to think out the line of action best suited to the individual. Moreover, cumbersome or elaborate apparatus might be required which would not be present unless the need for it had been appreciated beforehand. The examination was an advantage to the patient, who felt that nothing was being left to chance; to the anaesthetist, who might glean important facts for his guidance; and to the surgeon, who was able to rely on the anaesthetist's guidance as to the patient's ability to stand a prolonged operation. The physician, who seldom saw an operation, was not so well qualified a guide. The risks which a patient ran were not confined to serious operations. For minor ones they were often grave, just because the slightness of the operation led to neglect of necessary precautions regarding the anaesthetic. In private practice patients in nursing homes were at hand and could be seen on the day before operation. In hospital practice there was routine examination by house officers, and the anaesthetist was supplied with the information acquired. One class of patient which was admitted to the cancer department of the Middlesex Hospital had especially emphasized the importance of a preliminary examination—cachectic debilitated persons, often with secondary growths in the mediastinum or pleura and obstructed air passages. These cases made one extremely cautious in examination before deciding to give an anaesthetic.

Dr. W. J. MCCARDIE read a paper on "Explosion of ether vapour during laryngoscopy":

A man of 56 was given open ether to induce anaesthesia for laryngoscopy and removal of a piece of the vocal cord. For some minutes before the laryngoscope was introduced ether with oxygen was given through a nasal catheter in addition to ether from the mask. The mouth being opened, ether and oxygen still passing in through the nose, Mr. Woodman began to introduce Hill's electric laryngoscope. It had not entered more than an inch when there occurred two or three loud reports like small pistol shots, and flames issued from the patient's mouth. These were five or six inches high, and like those seen if a bottle of ether were set on fire. The nasal tube was at once pulled out and the flames quickly died. Anaesthesia was continued with chloroform and oxygen without trouble. There was no obvious burning—merely reddening of the mouth and pharynx—and the patient recovered normally and had no after-cough. At the time of the explosion the room (temperature 65° F.) was lit by two ¼-watt bulbs and one Osram bulb under a shade 2½ feet away almost directly over the patient's head. The bulb of the laryngoscope light did not fuse and the light appeared in order and there was no evidence of short-circuiting.

Commenting on this case, Dr. McCardie said that no heat could be felt by the hand when the light was first switched on. The warm room, warm mouth, warm electric light, warm ether and oxygen, would all help towards the explosion. Ether vapour would take fire at a considerable distance from the source of heat. Dr. Squibb had seen ether take fire at a measured distance of 15 feet between the source of escaping vapour and the source of fire. Considering the absolute coincidence of the explosion with the introduction of the lamp, the cause must be found in the electric bulb of the laryngoscope. Dr. McCardie related the only other recorded case of ignition of ether vapour in the presence of a closed electric light, and other members of the Section brought forward instances of ether vapour ignition under various circumstances.

FAECES IN ALIMENTARY DISORDERS.

AT a meeting of the Pathological Section of the Liverpool Medical Institution, held on March 17th, with Dr. R. W. MACKENNA, Vice-President, in the chair, Dr. ROBERT COOPE read a paper on the faeces in alimentary disorders. He outlined the normal characters of the faeces and emphasized the almost complete absence of food residues in the normal stool. If food residues were found in the stools in any notable amount there was (*a*) some failure of digestion, or (*b*) failure of absorption, or (*c*) hurrying on of the food—that is, diarrhoea. He was convinced that, though specialized chemical operations were sometimes necessary, in most cases a comparatively simple technique was adequate for all clinical purposes. It was essential to control the diet if valid deductions were to be drawn, and drugs should be withheld for some days before examination, especially oily bodies like olive oil and liquid paraffin, and purgatives, which might cause irritation of the gut or interfere with normal digestion. He divided the examination of stools into macroscopic, microscopic, and chemical, demonstrating the methods employed. Macroscopically, the most important abnormalities to be looked for were connective tissue, mucous flakes, and parasites. Slides demonstrated the microscopic appearances of normal and abnormal muscle fibre remnants, fats, starch granules, vegetable débris, etc. The chemical tests for stercobilin, blood, and soluble albumin were outlined, and the value of examining both chemically and cytologically. The value of a saline lavage of the large bowel was emphasized.

Two kinds of abnormalities were distinguished—(*a*) absence of normal constituents, and (*b*) presence of abnormal constituents. In the first category was stercobilin, derived from bile pigment by the reducing action of the intestinal bacteria, absence of which indicated that bile was not reaching the intestine. In the second

category were certain food residues, blood, soluble albumin and mucus. The appearance of connective tissue in any notable amount in the stools proved that there was failure of gastric digestion. The significance of imperfectly digested voluntary muscle fibre was discussed and two types of associated digestive trouble were mentioned—(1) those associated with definite pancreatic insufficiency, and (2) those in which there was no satisfactory evidence of pancreatic trouble. In both cases there might be excessive protein putrefaction in the large intestine, with indoxyluria, colitis, and sometimes general toxaemic symptoms. The abnormal presence of starch grains often indicated nothing more than a diarrhoea, sometimes the condition of so-called "carbohydrate dyspepsia," which was due either to excess of carbohydrate food or to some infection or catarrh of the small intestine. He did not regard it as indicative of pancreatic disease. As regards fat, Dr. Coope thought there were two fundamental questions to ask: (1) Was there excess of *any* type of fat in the stool? (2) If so, was it an excess of split or unsplit fat? In his experience microscopic examination was usually quite adequate for clinical purposes. As the important point in the latter question was to learn whether the neutral fat of the food had been split into glycerin and fatty acid to the usual extent, no clinical purpose was served by distinguishing between the two types of split fat—namely, free fatty acids and soaps. Absolute excess of unsplit fat indicated pancreatic insufficiency, or a rapid passage of food through the intestine (for example, gastro-colic fistula). Absolute excess of split fat might indicate (*a*) marked diarrhoea, or (*b*) pancreatic insufficiency where means other than the pancreatic juice had split the fat, or (*c*) lack of absorption due to absence of bile or to disease of the gut wall (for example, sprue, amyloid disease). The significance of blood and soluble albumin were then discussed. Mucus was normally unrecognizable, but might occur abnormally as flakes intimately mixed with the faeces, incorporated in the small intestine or in the initial portion of the large bowel, where the faeces were still fluid. In such cases the cause was probably irritation, bacterial or chemical, of the gut wall, or possibly diarrhoea. Again, it might occur as mucus surrounding the formed faeces, produced in the terminal portion of the large bowel. Here it was usually due to constipation. In putrid fluid faeces, as in typhoid, the abnormal mucus might be digested and not appear in the stools at all. Dr. Coope then cited various cases illustrating the value or otherwise of various findings in the stools.

PUBLIC HEALTH LABORATORIES AND PREVENTIVE MEDICINE.

AT a meeting of the Society of Medical Officers of Health, held on March 18th, with the President, Lieut.-Colonel F. E. FREMANTLE, M.P., in the chair, Dr. A. T. NANKIVELL opened a discussion upon "The relation of the laboratory to preventive medicine." After referring to existing county and county borough laboratories, he said it was doubtful if it was desirable to multiply the number of small laboratories; though where the medical officer of health was sufficiently qualified, a small laboratory properly staffed might be most useful, especially in speedily dealing with diphtheria specimens. He advocated wholesale swabbing of school children in face of an outbreak of diphtheria, and deprecated the practice adopted in some of the hospitals of the Metropolitan Asylums Board of discharging diphtheria patients without previously taking swabs of them. He urged every medical officer of health who had a laboratory to undertake some research work.

Dr. E. W. GOODALL said that he had given up the routine practice of requiring two negative swabs before discharging a patient from hospital, and he found that his results were quite as good, if not better, than in those hospitals where swabbing was resorted to. Surgeon Rear Admiral BASSETT-SMITH, Dr. MONCKTON COPEMAN, and other speakers insisted that the virulence test must be applied when deciding whether a positive result was really dangerous. The PRESIDENT said that the war had opened our eyes to the fact that the laboratory had a wider view than that of the prevention of diphtheria. In Mesopotamia plague could not have been kept down without the assistance of the laboratory, where rats could be quickly examined and the affected bazaar located. He disapproved of the setting up of small laboratories.

Reviews.

CEREBRAL DEVELOPMENT AND FUNCTION.

IN 1894 Dr. PAUL FLECHSIG delivered his memorable address at the University of Leipzig, afterwards (1896) published in the book entitled *Gehirn und Seele*. His pioneer researches were of epoch-making importance, for he showed that there was a time correspondence in the myelination of neuronic systems, during the development of the central nervous system and their manifestation of function. Although the hopes that were entertained by Flechsig and his followers regarding the possibility of an anatomical explanation of cerebral function have not been fulfilled, yet certain fundamental principles have been established.

The method of study which he employed was a systematic examination of sections of the brains of a number of foetuses, of newborn infants, and of infants of various ages after birth stained by the Weigert-Pal method. He was able to determine the successive stages in the myelination of neuronic systems and the times in which these appeared. The inference that myelination is indicative of preparedness for function is the fundamental principle, and in the main Flechsig's investigations are in accordance with the psycho-physiological evolution of the child.

The structures at the base of the brain, for the most part, and the cerebellum were found to be myelinated before birth; whereas in the newborn infant the cerebrum only exhibited isolated regions of myelination around the primary fissures—namely, the central, calcarine, and the Sylvian; these are the regions of the primary projection centres of movement and of the special senses. The remainder of the cortex is not myelinated, and constitutes the association centres, as yet unprepared for function. Upon anatomical grounds, therefore, it may be postulated that a child at birth may have a simple sensation. Since after birth every visual or auditory sensation tends to activation, especially to exploratory tactile-motor reactions, simple sensations give place *gradatim* to more and more complex perceptions and memories of the associated experiences; correspondingly there is more extensive myelination indicative of preparedness for these increasingly complex functions of perception and memory.

Flechsig's new book[1] is a continuation and extension of these studies. He divided the cortex according to myelogenesis but without regard to the anatomical point of view into primordial, intermediary, and terminal areas. The plates, twenty-five in number, are extremely well executed, and exhibit in a striking manner the successive stages of prenatal myelination, commencing with the brains of foetuses of 32 to 43 cm. long; they show also post-natal myelination of premature and normal newborn infants that had lived days, weeks, and months—the oldest being 9 months—and lastly the brain of an adult aged 40 years. Whether all the intermediary and terminal areas of myelination described by Flechsig can be supported by these investigations or not, they show clearly that there exist three areas of successive myelination—namely, (1) primary sensory-motor, adjacent to primary fissures; (2) psycho-sensory-motor cortical areas, adjacent to the primary sensory-motor areas; and (3) terminal associational, in the frontal, temporal and parietal lobes. This myelogenic evolution, indicative of preparedness for function, in a broad way conforms to the phylogenesis of the cortex. In the primordial region we find interposed in the normal cell lamination neurones which serve as the arrival and departure platforms of sensory-motor impulses. In the adjacent psycho-sensory-motor areas (intermediary areas of myelination) there is a characteristic cell lamination, and it may be postulated that these areas are concerned with elaboration of the sensory-motor functions of the primordial

[1] *Anatomie des Menschlichen Gehirns und Rückenmarks auf Myelogenetischer Grundlage.* By Paul Flechsig. Leipzig: Georg Thieme. 1920. (Demy 4to, pp. 121; 25 plates, 8 figures. £1 5s. 8d.)

regions, whereas the terminal areas of the frontal, parietal, and temporal lobes are especially concerned with the integration of the primordial and intermediate areas. The first evidence of association is in the corpus callosum, which associates the sensory-motor functions of the two hemispheres. Myelination can be seen commencing in this structure in the newborn full-term infant. When there is evidence of complete myelination the whole cortex is prepared for function, and there is a psychic unity whereby the whole seat of consciousness is involved in even the simplest action.

The more important conclusions stated by Flechsig in this volume may be stated as follows: With full-term birth cortex fibre myelination is divided into two approximately equal phases of four months each. In the prenatal period sixteen primordial areas of myelination can be differentiated, ten of them being sensorial areas and six of them autonomous fields of unknown significance. After birth the fibres medullated are at first related to those already functioning. But later on two new groups mature, the one consisting of projection systems related to the primordial areas and in anatomical juxtaposition to them; the second group of terminal areas has representatives centrally situated in the frontal, parietal, and temporal lobes respectively, and their function is to co-ordinate all the projection systems around.

In all, Professor Flechsig differentiated forty-five areas of myelination in the cerebral cortex, and his studies also mark off certain very definite tracts in the white matter. He proceeds to correlate these findings with those from pathological secondary degenerations obtained by other observers, and he considers that the following deductions can be drawn:

In the first place, those areas whose destruction causes sensory or motor loss coincide with his primary sensorial areas. Secondly, one primary sensorial area is not directly connected with others, nor is it in promiscuous relationship with the whole of the remaining cerebral cortex. The only exception which appears likely concerns smell and taste, whose areas are in intimate interrelationship. A developmental study of the fasciculus longitudinalis inferior shows that it consists of smaller units, and Professor Flechsig protests against findings in the lower mammals being hastily assumed to hold good for man. Between two primary sensorial areas intervene at least two bordering zones, and, in addition, perhaps a terminal area.

He thinks it probable that the study of aphasia will demonstrate that memory pictures of sensations are preserved in the intermediate areas bordering on the sensorial, but whether the terminal areas are to be regarded simply as organs for associated memory traces must be left for future investigation to determine. It may also show that the cortex can be regarded functionally as divisible into territories, related each to a sensorial area, and concerned in the elaboration of one kind of sensory data.

The study of myelination throws an interesting light on the composition of the corpus callosum, which develops *pari passu* with the cerebral cortex. This study has important bearings on macroscopical brain anatomy also. For example, the Rolandic fissure separates the frontal and parietal lobes, and yet it is placed in the centre of a small area which has a distinctive development of its own. Again, other sulci are in juxtaposition to several areas of widely different development. Sulci in relation to the primary sensory areas, such as the Rolandic or calcarine fissures, are constant; those of later development vary widely in situation. The first temporal convolution is always related to auditory sensations, but, on the other hand, the third frontal convolution includes three areas differing in myelogenesis.

Professor Flechsig finds that his frontal and parietal terminal areas correspond exactly to the frontal and parietal eminences, and he holds that within narrow limits, and more especially in the child, the extent of development of these areas affects the shape of the skull.

This book can be commended, not only for the account of the valuable researches it contains, but also for the excellent way it which it is illustrated by coloured plates with descriptive text.

FREDK. W. MOTT.

NERVE INJURIES.

THE volume, *Injuries of the Peripheral Nerves*,[2] is in many respects a challenging book, in many respects an admirable one. We can imagine that some who have saturated themselves in the subject of nerve injuries will disagree with a number of things to which Mr. SOUTTAR commits himself without a tremor or a hint that any other manœuvre might be tried in its place. But since very few are in agreement on certain aspects of this vexed subject, this is not an essentially important point. Unanimity of opinion is not yet to be found, particularly as regards the results of various kinds of operations. This book must be taken as giving us the views of Mr. SOUTTAR and Mr. TWINING on nerve injuries. No one reading it will be in any doubt as to what the authors' views are. They are clearly and dogmatically expressed, so that those who have only an elementary knowledge of nerve injuries can pick the book up and quickly render themselves much wiser men.

The arrangement of the chapters is excellent, and the authors have been well advised in keeping them on the short side. No lack of continuity has resulted from this, and it makes the book vastly easier to read. The changes in the nerve itself following injury are lucidly described, and a chapter is given to that vital point—changes in the surrounding and distal tissues and the influence of such changes on the final result obtained. Then follows a short account of the methods of examination of these cases in general and of the various nerves in particular, illuminated from time to time by short histories of cases. These have been well chosen, and include civilian injuries as well as war wounds, thus rounding the tale to its great benefit.

Descriptions of the technique of operations of various kinds occupies a great part of the book. Exception must be taken to the drawing tight of the tension suture in end-to-end junction of the divided nerve. Indeed, individual operators will find in the pages hereabouts a great deal with which they may disagree. Particularly is this the case with the "bulb-flap" operation figured on pp. 76 and 77, a proceeding physiologically unsound, although the author claims a success for it in Case 14. A similar objection will be raised with regard to the anastomosis or shunting of the distal end of a divided nerve into the side of a nerve previously sound. The authors state that the operation can be carried out without any permanent injury to the contributory nerve. They state that one-third of any ordinary nerve may be divided without any permanent loss of function. This is tantamount to saying that any nerve injury which involves not more than one-third of its fibres will lead to no disability of moment. We should have imagined that their experience with nerve injuries would have taught them that this is too sweeping a statement altogether. In spite of these objections Mr. Souttar and Mr. Twining are to be congratulated on a good piece of work. They have made the subject easy, indeed too easy. For after reading this book the uninitiated will believe that nerve injuries are rather simple things with which to deal.

We will not close this notice without a few words of congratulation to Messrs. John Wright, the publishers. They have produced a book which, in these degenerate days of printing and binding, it is a pleasure to handle.

PSYCHOLOGY AND PSYCHOTHERAPY.

DR. WILLIAM BROWN has published a number of articles on the psychological principles which underlie the modern theory and practice of psychotherapy, and in his book entitled *Psychology and Psychotherapy*[3] he evidently intends to develop his views in more systematic form. This aim has not been quite successfully accomplished, and it would probably have been more satisfactory if Dr. Brown had decided to publish his book merely as a collection of essays on psychological topics. As it is, there are abrupt changes of theme, a number of repetitions, and a relative absence of a progressive development of any particular line of thought; all this rather tends to bewilder the reader.

[2] *Injuries of the Peripheral Nerves.* By H. Souttar, C.B.E., F.R.C.S., M.Ch.Oxon., and E. W. Twining, M.R.C.S., L.R.C.P. Bristol: John Wright and Sons, Ltd. London: Simpkin, Marshall, Hamilton, Kent and Co., Ltd. 1920. (Roy. 8vo, pp. 162; 30 figures. 18s. 6d. net.)

[3] *Psychology and Psychotherapy.* By William Brown, M.A., M.D. Oxon., D.Sc.Lond. With a foreword by William Aldren Turner, C.B., M.D. London: Edward Arnold. 1921. (Cr. 8vo, pp. xi+196. 8s. 6d. net.)

Much attention is given to Freud's views, and a number of critical comments are made in respect to them. Dr. Brown does not accept the theory that the psychoneuroses are invariably the expression of maladaptation in the sexual sphere, but he has found the psycho-analytic method a valuable therapeutic measure. He does not, however, employ this method in its pure form, but relies largely on what he terms autognosis for the treatment of his cases. While "free association" forms part of his treatment, he utilizes explanatory, persuasive and suggestive methods as well. We believe that Dr. Brown is perfectly right in stating that suggestion plays a large part in the psycho-analytic method. It certainly does if we can go by the published accounts. It is frequently stated in authoritative psycho-analytic journals that the analyst points out to the patient the sexual symbolic meaning of the manifest content of his dream. This is, of course, direct suggestion, but, as the author observes, it is impossible to exclude unconscious suggestion however carefully the psycho-analytic technique is carried out. He expresses the view that there are four fundamental and relatively independent psychic factors at work in the cure of mental illness, namely, psycho-synthesis, psycho-catharsis, autognosis, and the personal influence of the physician.

In the sphere of purely academic psychology Dr. Brown contributes an interesting chapter on the theories as to the relation of mind and brain. He gives an account of Bergson's interaction theory, and himself favours the views expressed in *Matter and Memory* rather than the parallelistic hypotheses. It would have been of service if the author had developed these questions rather more fully, but he has suggested points of view which are of definite value. We note with a certain amount of surprise that Dr. Brown refers to telepathy almost as if it were a subject which had reached a stage of proof and was no longer debatable.

Though certain criticisms of this book have suggested themselves, it contains, as might be expected in view of the wide knowledge of the author, many features of interest to the psychopathologist.

DISEASES OF INFANTS AND CHILDREN.

PROFESSOR CROZER GRIFFITH, of Philadelphia, has written a comprehensive book on *The Diseases of Infants and Children*.[4] It is founded on a long experience of hospital and private practice, and of teaching. The arrangement of the volume follows the usual plan, beginning with the anatomy and physiology of child life, infant feeding and relative food data, passing to infectious and general diseases, and then dealing with diseases of the various systems. The number of illustrations, both photographs and clinical charts, is large, and the short reports of cases appended increase the clinical character and practical value of the book, and can, indeed, be studied independently of the text. The coloured plates are also to be commended, especially those of the infant's normal and abnormal stools. The numerous references to medical literature include not only current, but also historical literature. Indeed, they are so numerous as sometimes to overload the text and obscure the author's own individual experience.

The book is as nearly encyclopaedic as it is possible for the book of one man to be, yet the treatment of some important aspects of disease in children is curiously slight. In dealing with rickets and scurvy, recent important work upon vitamins is merely mentioned. Also, America has in the last five years produced many careful and illuminating investigations upon clinical types of anaphylaxis and their diagnosis by the specific protein tests, yet this subject is only glanced at. The large subject of mental defect and imbecility is compressed into ten pages. These, however, are small defects in comparison with the great merits of the book. Above all other things, it bears the stamp of long and sound clinical experience—nearly forty years of practice and teaching; and the author's very numerous contributions to medical literature have already made his name familiar to practitioners on this side of the Atlantic. The book will be valuable not only to the specialist in the subject, but also to the practitioner in his daily dealings with sick children.

[4] *The Diseases of Infants and Children.* By J. P. Crozer Griffith, M.D., Ph.D. Philadelphia and London: W. B. Saunders Co. (Double roy. 16mo; 2 vols., pp. 885 and 657; with 436 illustrations, including 20 coloured plates. 72s. net.)

DISEASES OF THE NEWBORN.

WHEN, in 1914, Dr. RITTER VON REUSS's work on the diseases of the newborn appeared in Austria, it was reviewed at some length in the pages of this JOURNAL (1914, vol. i, p. 918), and the opinion was expressed that it constituted a safe and reliable guide in dealing with the diseases of early life. A great deal has been written about neonatal diseases since 1914, and the whole subject has been greatly advanced; in particular, a resolute effort has been made to understand better and to treat more effectively the maladies of the first month of life, bearing in mind that at no other time is mortality so high. The English translation, published under the title *The Diseases of the Newborn*[5] is therefore welcome. There are one or two slightly mysterious features about the volume. The title-page, (which bears the date 1920) shows no name of a translator, although, let it be said at once, the rendering is admirable. On the paper cover, however, Dr. John D. Rolleston is described as the reviser of the translation. Further, there is no preface or prefatorial paragraph explaining the purpose or the occasion of the translation. Curiosity regarding these matters remains unsatisfied. The reader will, none the less, be glad to have Dr. von Reuss's work in its English dress. There is a very long bibliography of some fifty pages, but it is weak in its references to British contributions to neonatal pathology and medicine; for instance, Ashby and Wright only appear in a secondary fashion as quoted by another author, and not a few of the original titles of English articles are lacking, being represented by what seem to be headings from foreign literature lists. The publishers, however, have turned out the work sumptuously, and deserve a word of praise.

NOTES ON BOOKS.

MR. PAUL BOUSFIELD feels that there is no book on psycho-analysis which exactly meets the needs of the practitioner unversed in the technicalities of psychology and psychotherapy, and his book on *The Elements of Practical Psycho-Analysis*[6] aims at remedying this deficiency. In view of the enormous output of literature dealing with this subject it would seem that there must already be plenty of books from which the practitioner might make a selection, and it is thus somewhat difficult to support the author's contention. In any case the influence which Mr. Bousfield anticipates the new psychology will have on future social customs is so unattractive that many readers will be tempted to wish a speedy end to the whole movement as he presents it.

In his book on *Psychoanalysis: its History, Theory, and Practice*,[7] Mr. ANDRÉ TRIDON endeavours to present an unpartisan treatment of his subject. He deplores the antagonism between the leaders of the various schools of thought, and attributes this mainly to personal animus among them. The author covers a wide range of problems which he seeks to interpret in accordance with the theories of Jung, Freud, and Adler. The same author is responsible for another book on similar lines entitled *Psychoanalysis and Behaviour*.[8] Here he shows himself strongly influenced by the work of Dr. Edward J. Kempf, and he gives a useful outline of his theories of behaviour. There is little doubt that Dr. Kempf's physiological interpretations of human reactions are of considerable significance, and they may do much to replace the metaphysical formulations of Freud and Jung, though his actual views are inspired by Freud to a large extent.

The issue of *Medical Science, Abstracts and Reviews* for April is the first number of a new volume—the fourth. It contains, among other reviews, one on alimentary diseases, with a copious bibliography, and another on non-tuberculous juvenile coxalgia. Two indexes to Volume III are supplied, the one of subjects and the other of authors.

[5] *The Diseases of the Newborn.* By August Ritter von Reuss, Director of the Department for the Newborn at the First University Women's Clinic in Vienna. Translation revised by John D. Rolleston, M.D., B.Ch., M.A.Oxon., assistant medical officer, Grove Hospital, Tooting. London: John Bale, Sons, and Danielsson, Limited. 1921. (Roy. 8vo, pp. 638; 90 figures. 52s. net.)

[6] *The Elements of Practical Psycho-Analysis.* By Paul Bousfield, M.R.C.S., L.R.C.P. London: Kegan Paul, Trench, Trubner and Co., Ltd. 1920. (Demy 8vo, pp. viii+276. 10s. 6d. net.)

[7] *Psychoanalysis: its History, Theory, and Practice.* By André Tridon. London: Kegan Paul, Trench, Trubner and Co., Ltd. 1920. (Cr. 8vo, pp. 272. 10s. 6d. net.)

[8] *Psychoanalysis and Behaviour.* By André Tridon. London: Kegan Paul, Trench, Trubner and Co., Ltd. 1921. (Cr. 8vo, pp. 354. 10s. 6d. net.)

EIGHT of the principal publishing houses in Paris which issue medical and scientific books have combined in the production of a *Bibliographie des Livres Français de Médecine et de Sciences*. It is a joint catalogue of books published by the eight firms in the years 1908-20. The books are classified according to subject and particulars as to size and price are given. The volume is provided with an index of authors' names and with a list of periodical publications. It is a new departure very much to be commended and one worthy of imitation. Copies can, we understand, be obtained on application to the Section de Médecine du Syndicat des Éditeurs, Hôtel du Cercle de la Librairie, Boulevard Saint-Germain, 117, Paris (VI^e^).

MEDICINE IN PUBLIC LIFE.

MEDICAL DINNER AT EXETER.

THE Minister of Health, Dr. Addison, was the chief guest at a dinner given by the Mayor of Exeter (Mr. Arthur C. Roper, F.R.C.S.Edin.) to the members of the medical profession at the Guildhall, Exeter, on March 30th.

Proposing the health of Dr. Addison, Dr. ROPER said no function during his term of office, so far, had given him greater pleasure than that of entertaining a large number of his professional friends, old and young. Some, but not many, were his seniors; a good many were his contemporaries; others were his juniors, and some of them he knew very well and intimately. Referring to the presence of the Minister of Health, the Mayor said that Dr. Addison occupied a unique position in the medical profession. He was looked upon from widely divergent points of view, but, whatever the view, they must all recognize him as one of themselves—(Hear, hear)—as one who, equally with themselves, was doing his best to serve and to benefit the health of the nation. In asking the company to drink Dr. Addison's health, Dr. Roper wished him every success in piloting the ship that bore a precious cargo safe to the haven where he would receive the gratitude of a benefited and healthy nation. (Applause.)

SPEECH BY THE MINISTER OF HEALTH.

Rising to respond, Dr. ADDISON received an ovation. He said the man who deserted a professional career and entered upon the uncertain path of a political life was looked upon somewhat as a suspect by the average professional man. He was glad that, at all events, the citizens of Exeter had recognized that medical men in their city council could and ought to render service. And what was true of the city of Exeter he thought ought to be true in the councils of the State. It always seemed to him to be a singular drawback to their profession that, immersed as most of them were in attendance upon the individual, they were apt to overlook, or perhaps they had not time to think about, the community of which that individual formed but a single part. They did not require to think far before coming to recognize that there were some things which as professional men they knew should be done, and could be done, but which could not be accomplished under any circumstances by individual effort. They could only be brought about in some measure by the collective action of instruments of government in some form or another. He believed that a good many medical men regarded the medical politician as a suspect because they did not quite see what he was getting at. The reason for that, he thought, was because their profession was so interesting and their work so absorbing that they had neither the time nor the disposition to study health questions from the State point of view. Whether or not that was the explanation, he recognized the fact and endured it with all the fortitude he could. While there had grown up in this country a collection of responsibilities, powers, and duties, scattered about through various departments of the State, concerned more or less with promoting, preserving, or protecting the life and health of the individual citizen, they had never been brought together, organized collectively, and directed as one so far as was possible. The Ministry had not yet been at work very long; it had had a good many teething troubles—(laughter)—while they were not without their critics—(renewed laughter)—especially in certain sections of the Press, who were much interested in the promotion of a "stunt," as they called it, or in ventilating a personal grudge sometimes against a Minister of Health—he being, for the moment, a useful vehicle—but who were not so anxious perhaps at all times to state or consider the facts of the case on their merits, and so it came about that there were many things which had never been stated or even understood.

Housing as a Preventive Health Service.

In the first place he thought that the organization of the health services of the State and their development ought to be with the Government the motive for increasing the value and efficiency of the services for the prevention of sickness and disease. No subject undertaken at the Ministry of Health had brought them more ridicule, should he say, than that of housing, but he put housing first as a preventive health service. A start had been made, and they at least knew where they were going. For the first time a duty had been cast—and he did not apologize for its being a duty—upon local authorities to make a return as to what were the needs of the community in terms of houses. According to the 1911 standard two million people were said to be living under insanitary conditions. Well, he wanted to alter that standard. It was useless to talk of stamping out tubercle when so many people were compelled to live in houses condemned as unfit for human habitation. It might well be that it would take twenty years to get the rehousing of this country on a well established basis; but that was a matter of no consequence. What mattered was that they had obtained a minimum standard based upon the health requirements of the nation affecting the lives of the people two-thirds of the hours they lived. The measure was more essential, he believed, to improving the health and well-being of the child and other population than any other one measure that could have been taken up. (Applause.) It was true they had been beset with all manner of difficulties, but they had ploughed their way through some of them. No enterprise had ever succeeded without difficulties, and they would be overcome in time. Soon they would be coming to the second stage—the allocation to every city and town within the limits of finance available a sum to help in dealing with the insanitary dwellings in their midst, and he believed the views of the medical profession thereupon would be unanimous. (Applause.)

Medical Guidance in Public Affairs.

Proceeding, Dr. Addison said there could be no doubt that the medical profession would, more and more, be forced into public affairs. Public opinion and the spread of education would do it. It was one of the first requirements of their profession that there should be bodies of men in the different districts, and some bodies central, who were accustomed to meet together to consider and discuss public questions in which professional knowledge or interests were concerned, so as to obtain from time to time as required, and to be able to give, responsible and considered professional advice. Public bodies and also the State, he thought, had often gone wrong, or missed an opportunity because it had not had the guidance and advice from those, and those only, who knew—advice which it might have been possible to obtain. So it had come about that they had had difficulties owing to the lack of such advice, and he repeated what he had already said in London a short time ago—the request to his professional brethren to get busy on this matter.

Going on to refer to the question of hospitals, the speaker said the great masses of the people were needing more expeditious hospital treatment and that the accommodation available for them in the voluntary institutions at the present was insufficient. Side by side with this was the mass of empty accommodation, and it was impossible to think that they could go on for ever like that. There was the demand on the one side and the supply on the other; but the two never met, and because the Ministry were venturing to think a little in advance they got into trouble; still they were going on with it all the same. (Applause.) With regard to the cancer problem, Dr. Addison said he should like to see a more comprehensive attempt made to tackle it. Looking at the results from such knowledge as could be gleaned, it did not seem to him that they were much further ahead as yet. The tale of death was still as great, if not greater, and he thought there was a big opportunity for a wise expenditure of money in the interests of

economy. (Hear, hear.) Statistics showed that in 1918 58,000 died of tuberculosis in this country, the previous lowest year being 1913, when there were 49,000 deaths. In 1919 the number fell to 46,000, and last year it dropped to 42,000. As to the cost of the whole tuberculosis service, taking the country as a whole, it worked out at rather less than a penny rate in regard to expenditure of local authorities, and a farthing out of every £ in regard to the Exchequer. With regard to infant mortality, the death-rate in London fell to 85 in 1919, and last year was down to 75. He understood it was still going down, but it could go down to 50 if only they did the job properly.

In conclusion, Dr. Addison said that preventive medicine was the cheapest investment for the State. Well-considered and well-directed health efforts were cheap and paid, and they were only just beginning to see it in this country. But as they came to see it, the medical profession would be dragged right into it; of that there was no question, and therefore he had no manner of doubt that, as on every other occasion which had called for their response, they would rise to it quite easily in their singularly characteristic British fashion. But he was quite sure that the time was at hand, and great would be their opportunity. (Applause.)

INDUSTRIAL FATIGUE AND VENTILATION.

THE latest report of the Industrial Fatigue Research Board consists of a volume of preliminary notes on atmospheric conditions in boot and shoe factories.* The first report of this series, which was mainly introductory, gave a short history of the industry and a condensed description of the processes carried on, and also certain information relating to individual differences in output.

The present report, which deals with the practical use of the kata-thermometer as an indicator of atmospheric conditions from a physiological aspect, is based upon observations made in a number of boot and shoe factories under varying conditions, and also, for purposes of comparison, in an aircraft doping room. The kata-thermometer, it will be remembered, was devised by Dr. Leonard Hill in the course of his researches into the subject of ventilation. It is designed to measure its own rate of cooling at a temperature approximately that of the human body, and has an alcohol reservoir in the form of a cylindrical bulb, a stem graduated in tenths of a degree from 95° F. to 100° F., and at the top a small bulb, which acts as a safety overflow when the thermometer is heated, and readings are taken with the "kata" used both as a dry bulb and as a wet bulb thermometer. Hitherto no systematic attempt has been made to investigate on a large scale the particular aspect of ventilation which determines the physiological state of the person exposed to it—that is, the cooling power of the air—in order to correlate it with fatigue and production. A means of measuring this effect is now, however, afforded by the kata-thermometer, and it was accordingly decided to start a series of observations in boot and shoe factories with the object of studying the importance of this factor of the workers' environment.

The inquiry has not yet progressed far enough to justify any definite conclusions as to the relation of atmospheric conditions to fatigue and efficiency, but, having regard to the novelty of the method of observation involved, there is a certain advantage to be gained by the publication of this preliminary report indicating the conditions actually existing in different departments. The kata-thermometer deals only with the physiological effect of ventilation, as measured by the cooling power of the air. It takes no count of other aspects of ventilation such as the avoidance of infection and the rate of change of the air in the room—that is to say, the replacement of stale air by fresh. This instrument, moreover, is much more susceptible to local conditions than is the thermometer, so that any given reading can only be taken as applying to the point of observation. It is designed to measure rates of cooling that are dependent on temperatures, humidities, and velocities of air currents, and rates of cooling give information with regard to standards of comfort and efficiency.

As the result of the investigations, which were carried out first under the direction of Professor T. Loveday, M.A., and later of Professor E. L. Collis, M.D., the report points out that an atmosphere which will help to sustain physical energy should be cool rather than hot, dry rather than damp, and there should be brisk air movement. Neglect of these conditions may cause physical disability and inefficiency.

There is some evidence to show that atmospheric conditions deteriorate from morning to evening in the workshop, and also that this makes additional demands on the workers' energy. Examination of summer and winter records taken at several factories suggests that systems of ventilation which are adequate in winter cannot always ensure desirable physical conditions under adverse outdoor conditions in summer. Machinery in motion has an appreciable effect on atmospheric movement, and careful consideration should be given to the ventilation in small rooms used for special processes which are shut off from main air currents. Consideration of ventilation in single and multi-storied buildings indicates that the latter structures have slightly higher rates of cooling, a narrower range from winter to summer atmospheres, and a greater air velocity. Experiments carried on in an aircraft doping room showed the high rates of cooling obtained by frequent air change at high velocity, and the application of the doping-room system of ventilation to boot and shoe factories was considered. A study of the atmospheric conditions in the principal departments suggests that rates of cooling and atmospheres were not adapted to the nature of occupations. For instance, there was some indication that "clicking" rooms were too cold in winter and too hot in summer; that the air velocities in each department were greater in summer than in winter; and that the summer rates of cooling in press rooms were below the standards recommended. In other departments, such as lasting and finishing rooms, where heavy manual work was in progress, rates of cooling and atmospheres for both summer and winter were found to be unsatisfactory.

An interesting section of the report shows the effect of clothing on skin temperatures, and the principle is illustrated that comfort during working hours could be enhanced by a more careful choice of clothing. Conversations with operatives showed that the heavy worker too often has the idea that profuse perspiration is a necessary consequence of his occupation, and he guards against chill by wearing heavy woollen garments which absorb moisture; but light clothing would be preferable because of its effect in allowing the free circulation of air between the garments and the skin.

This report is a further example of the useful work that is being carried on by the Industrial Fatigue Research Board, and gives one more reason—if that were needed—why this work ought to be continued for the benefit of the nation as a whole.

* Boot and Shoe Series. No. 2. H.M. Stationery Office. 1921. Price 3s. net.

PRESENTATION TO DR. J. A. MACDONALD.

THE following further subscriptions have been received from March 1st to April 4th, 1921, in response to the appeal published in the JOURNAL of July 24th, 1920 (p. 129), towards a presentation to Dr. J. A. Macdonald on the occasion of his retirement from the office of Chairman of Council of the British Medical Association which he had held for ten years. Subscriptions of any amount not exceeding five guineas should be made payable to "The Macdonald Presentation," and sent to the Medical Secretary, British Medical Association, 429, Strand, London, W.C.2.

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British Medical Journal.

SATURDAY, APRIL 9TH, 1921.

THE SCIENCE OF ETIOLOGY.

IN the mid-Victorian period the students of infectious disease had practically only two weapons, the clinical and the statistical. The former gave us such fundamental observations as the discrimination between typhus and typhoid fever, the latter a long series of fruitful generalizations, particularly as to water-borne disease, associated in this country especially with the names of Simon, Radcliffe, Buchanan, and Power. This was succeeded by a period during which thought was dominated by the astonishing achievements of the bacteriologists with regard to etiology, which the more sanguine spirits hoped would prove to be at once directly applicable for prevention. A great deal was accomplished, but not all that was hoped or even promised, and an inevitable reaction ensued, which was presently reinforced by the appearance of a new school of statistical epidemiologists provided with mathematical methods unknown to its Victorian predecessors. If to the plain man bacteriologists seem to have gone too far in apparently ignoring all but the bacterium, the new statistical etiologists seem to have proceeded to the verge of the absurd.

It was such considerations that induced us to publish, in our issue of March 19th (p. 432), an article entitled "The New Epidemiology." In it we endeavoured to point out that to ensure its future progress epidemiology must make use of two different implements, the bacteriological and the statistical, the underlying assumption being, of course, that both must rely for their fundamental data on clinical medicine. That both methods, bacteriological and statistical, must be used in the study of etiology might seem to be a truism, but we were quite prepared to incur a charge from either side of obscurantism, although pains were taken to avoid affording any justification for it. The accusation has come from the bacteriological side, and we take pleasure in publishing—for the subject is of immense importance—the following criticisms from the pen of a distinguished bacteriologist, written, as we understand, in consultation with a no less distinguished clinician.

"If Medicine," they write, "is not yet an exact science, it is doubtless because our experiences of disease, and our efforts to control it, yield exceedingly difficult material upon which to base sound conclusions. But the complexity of the processes involved, and the gaps in our knowledge, must not blind us to the greatness of the achievements of research. And since most of the advances in Medicine of recent years have been made possible by progress in our knowledge of causation, the growing science of etiology may be regarded as a sure measure of progress. An exact knowledge of causes is one of the most difficult and elusive of all quests in Medicine. In the case of the infective diseases, where some of the chief progress has been made, the problem is complicated by the circumstance that two of the factors involved are living organisms of independent vitality, of complex physiology, and each imbued with a tendency to vary. The causes of these variations both of microbe and host have still to be adequately determined."

"It would appear," they continue, "that there are at least two procedures for advancing the science of etiology. The first, which is the method of the vast majority of research workers to-day, may be described as follows: By persistent endeavour; by a patient and accurate collection of facts; by well-controlled and repeated observation; by appropriate and 'light-giving' experiment; by withholding conclusions until the ascertained data are adequate; and, finally, by considering all the evidence with due regard to each portion of it, to arrive slowly perhaps, but nevertheless surely, at certain knowledge. The method of the newer science of epidemiology is distinct from this. Instead of accumulating facts in laborious fashion, it aims at a solution of the problem by postulating causes and apparently by eliminating the principle of specificity. It may readily happen that a plausible explanation of any set of phenomena can be found which may satisfy the imagination for the time being. The ultimate value, however, of such a hypothesis depends not only upon its ability to account for a certain set of observed data, but upon its fate when tested by the stern reality of experience in the widest sense. Not the least valuable of the services rendered by bacteriology was the prompt dispersal which it effected of the dim mists of 'miasmology.' It is possible that the practical physician who finds that small-pox is derived from small-pox, measles from measles, and tuberculosis from tubercle, will be more inclined to believe in the strict specificity of such diseases, and in accumulated experience, than in a conception, however elastic and 'gap-filling'"—such as that put forward by some of the exponents of the newest statistical epidemiology.

We venture only one comment, which is that it would be a mistake to limit the term "research" to experiments in bacteriological and chemical laboratories; we feel sure that our correspondents did not intend so to limit it, but on a hasty perusal it might seem as though they did.

RECURRENCE OF BILIARY CALCULI.

IT is well established that calculi may re-form in the gall bladder after the operation of cholecystostomy and removal of what foreign contents there may have been within. This is, in fact, one of the chief arguments put forward in favour of cholecystectomy as against mere drainage. It is, however, known that trouble may sometimes recur after removal of the gall bladder entire, that such removal is not an absolute insurance against further biliary trouble. Some persistent discomfort in the right hypochondrium may be due to infective cholangitis or lymphangitis within the liver itself—a gall-stone cirrhosis. This complication is usually of a low grade and of far from outspoken symptomatology, and yet commoner, perhaps, than we realize.[1] But the chief and disturbing trouble which is liable to cause distress to the patient and discomfort to the surgeon is the recurrence of biliary colic after cholecystectomy has been well and truly performed.

Undoubtedly the most fertile source of after-trouble is the incomplete removal of stones at the primary operation. Notwithstanding that the surgeon to-day explores the biliary tract with care, every now and then a stone or stones are left behind. Sometimes there is a recurrence of symptoms in patients in whom the bile passages are known to have been cleared

[1] Peterman, Priest, and Graham: "The Association of Hepatitis with Experimental Cholecystitis," *Arch. of Surgery*, January, 1921, 92.

previously. Such cases always raise the question as to whether a stone can form anew, from nothing as it were, within the common and hepatic ducts. In many recurrences the possibility cannot be excluded that a stone may have wandered up into the intrahepatic pathways and so been overlooked. But when, after the finding and removal of such a calculus, symptoms of cholelithiasis come back again and yet again, the idea arises that the stones have been recreated in the bile ducts. It is known that these last are not pre-eminently the birthplaces of stones, which as a rule form within the gall bladder, and there are those in whom this belief is so strong that they would deny that a biliary calculus can arise elsewhere. It must be admitted that the most skilled surgeon after an exemplary search may fail to discover a calculus lodged within a small branch of the duct system within the liver substance, and that this calculus may later wander into a large duct and then be obvious to all.

This problem has been discussed by Deaver,[2] by Judd,[3] by Eisendrath,[4] and quite recently by Emerson Brewer.[5] Judd's figures from the Mayo clinic include 219 secondary operations on gall-stone cases. Eighty per cent. of these were for removal of a previously drained gall bladder. In six cases stones had to be removed from the common duct after a precedent cholecystectomy. In one case Judd removed a large stone from the common duct on three separate occasions, the gall bladder having been excised at the first sitting. Brewer's cases are of great interest. A woman had a cholecystostomy performed in 1911. Eighteen months later stones were removed from the common duct and the gall bladder excised. After a similar period of time trouble recurred and several large dark brown stones were found in the common duct. The duct system was explored by finger and probe well within the liver substance and left clear. Eight months later a fourth operation was undertaken and seven stones were scooped out, three high up in the hepatic ducts, well within the liver. One and a half years later a fifth operation was done and two or three stones removed. Experiences such as these point strongly towards the new formation of duct calculi. Unfortunately, Brewer does not give an account of the minute structure of the stones. Pigment calculi are the most likely to form without the agency of the gall bladder mucosa.

Lastly, in connexion with this subject reference must be made to Lewisohn's[6] interesting case of intrahepatic cholelithiasis. Here stones within the liver parenchyma perforated through it and caused local peritonitis. Again, stricture of the duct and periductal adhesions are causes of persistent trouble which must not be forgotten.

THE FIRST MINISTER OF HEALTH.

DR. CHRISTOPHER ADDISON will always be remembered in the history of health and public health in this country if only because, as President of the Local Government Board, he carried through the bill by which the Ministry of Health was established. The bill, in its general structure, was well conceived, and met the wishes expressed by the British Medical Association and other medical organizations. It was in accordance with expectation that Dr. Addison became the first Minister of Health. The Ministry came into existence on July 1st, 1919; to it were transferred all the powers and duties of the Local Government Board, together with those of the Insurance Commissioners for England and Wales. Other powers were to be transferred to it, but, as things stood, the task before the new Ministry was gigantic; it had to satisfy the expectations for better health conditions of the medical profession and the public generally, and, in particular, it had to attempt to make good the serious deficiency in housing, a deficiency which had been considerable before the war and had been greatly increased by the almost complete suspension of building during its progress. Obviously housing is of first importance in all health questions, but it is unfortunate that so much of the energy of the Minister had to be given up to this one subject, that so many obstacles—some of them unnecessary—were thrown in his way, and that he so early lost the services of Sir John Anderson, who had been specially selected to be second secretary of the Ministry in charge of housing. It is unfortunate also that the Ministry so early lost the services of a great public servant—one intimately acquainted with the more strictly medical side of its work and eager for its extension—by the death of Sir Robert Morant in March, 1920. At the beginning of that month Dr. Addison, in a review of the administrative action of the Ministry, gave some account of what had been undertaken in matters directly affecting health. He referred in particular to the strengthening of the powers of port sanitary authorities and to the multiplication of child welfare and midwifery centres, and mentioned some of the improvements it was intended to introduce into the insurance service. During last session the bill to remove sanatorium benefits from the National Insurance scheme and to place the treatment, other than domiciliary, of tuberculosis within the province of the local authorities was passed.

Commenting on the situation at the end of last May we observed that the hardest worked of all Government departments was the Ministry of Health, and asked for the sympathy and encouragement which its energetic efforts deserved. The subsequent history of the Ministry was not fortunate, and we cannot doubt that, as we pointed out at the time, Dr. Addison's position was seriously compromised by the introduction into an omnibus bill last autumn of legislation profoundly affecting the constitution of general hospitals. The mistake was seized upon by a certain section of the press, anxious, as we must suppose, to attack Mr. Lloyd George through his consistent supporter, Dr. Addison. Dr. Addison remains a Cabinet Minister, but we should have preferred to see him still at the Ministry of Health. It was a very great advantage in the early days of that Ministry to have a man who was by his training well aware of the professional outlook and ready, as on several occasions he showed, to attach due weight to the advice and criticisms of the profession. It would have been an advantage had he continued to be head of the Ministry now that some of the difficulties—we had almost said the artificial difficulties—the Ministry has encountered have been got out of the way.

THE ANNUAL MEETING AT NEWCASTLE.

THE details of the programme for the Annual Meeting at Newcastle-upon-Tyne are being gradually settled. The Representative Meeting will begin on Friday, July 15th, at 10 a.m., and will be continued on Saturday, Monday and Tuesday. On the latter day the statutory Annual General Meeting will be opened at 2 p.m., and will be resumed at

[2] Deaver: "Recurrence of Gall Stones," *Surg., Gynec., and Obstet.*, 25, 1917.
[3] Judd: "Recurrence of Symptoms following Operations on the Biliary Tract," *Ann. Surg.*, April, 1918.
[4] Eisendrath: "Recurrence after Operations on the Biliary Passages," *Journ. Amer. Med. Assoc.*, 1917, lix, p. 1752.
[5] Brewer: "Recurrence of Calculi in Common and Hepatic Ducts after Cholecystectomy," *Arch. of Surg.*, January, 1921, p. 145.
[6] Lewisohn: "Intrahepatic Cholelithiasis," *Ann. Surg.*, May, 1916.

8 p.m., when the incoming President, Professor David Drummond, C.B.E., will give his address; it will be followed by a reception in the Grand Assembly Rooms at 10 p.m., with the President and Mrs. Drummond as hosts. The Sectional Meetings begin on Wednesday, July 20th. The scientific work is to be dealt with in seventeen sections, of which five meet on each of the three days. Proctology and Urology are separate units this year, and each will hold a one-day session; this is a new departure which, it is hoped, will give an opportunity for useful discussion along special lines. The dates on which the several two-day and one-day sections will meet were announced in a Current Note in last week's SUPPLEMENT. The names of the officers of the various sections were announced in the SUPPLEMENT of March 5th, and those desirous of taking part in the work of any special section are invited to communicate direct with the honorary secretaries, whose addresses were there given. A special effort is being made to encourage interest in the afternoon demonstrations, which were very numerously attended at Cambridge last year. They are more informal than the morning sessions, and actual cases, specimens, apparatus, etc., are shown and discussed. At 8 p.m. on Wednesday, July 20th, there will be a Special Address in Industrial Medicine, by Sir Thomas Oliver, and on Friday, July 22nd, at 7.30 p.m., Professor Arthur Keith will deliver the popular lecture in the King's Hall of Armstrong College on "Evolutionary wounds, their healing, and the part they play in the evolution of the human body." The social arrangements already planned include, in addition to the President's reception, a garden party in Jesmond Dene, when the Association will be the guests of the Lord Mayor, an evening reception by the Branch Council, to be followed by a dance; and other evening parties at which dances have also been arranged.

R.A.M.C. WAR MEMORIAL.

SUBSCRIPTIONS in response to the appeal for funds to establish a war memorial to the officers and men of the R.A.M.C. who lost their lives in the war amount to about £19,500. Of this, £1,500 was ear-marked by the donors for the benefit of families and dependants, and at a meeting of the general committee, held recently under the chairmanship of Sir Alfred Keogh, it was decided that it should be divided between the R.A.M.C. Regular and Auxiliary Funds in proportions to be decided after the wishes of the committees at Portsmouth and Netley had been ascertained. The amount available for the purposes of the memorial itself will, it is anticipated, be, in round figures, £18,000. The proposal made to the meeting and eventually adopted by it unanimously was of a novel character, and will, we believe, commend itself to the Corps and to the medical profession generally. It has three parts: the first is to erect in Westminster Abbey, on the wall in a suitable position near the grave of the Unknown Warrior, a tablet commemorating the memory of the officers and men of the R.A.M.C., Regular, Territorial, and Temporary, who fell or died in the war; the second is that a list of their names should be inscribed on a "Golden Book" kept permanently in the Chapter House of the Abbey; and the third that a contribution should be made to the fund for the restoration of the Abbey. It was at first suggested that some definite concrete part of the restoration, such as the embellishment of a chapel, should be undertaken, but the Dean and Chapter, after consideration, found that the nature of the work being done was such that it was difficult, and in fact impossible, to set apart any particular section; it was accordingly decided to give the sum of £10,000 to the Abbey Restoration Fund and that the gift should be recorded on the memorial tablet. The Dean and Chapter entered cordially into the project for the permanent preservation of the "Golden Book" and for the erection of the tablet. The Director-General, vice-chairman of the committee, read the correspondence he had had with the Dean, and stated that when the proposal was placed before the Colonel-in-Chief of the Corps, Field Marshal the Duke of Connaught, he had shown himself most sympathetic and appreciative. The proposal, which it was understood originated with Colonel C. R. Tyrrell, C.B., C.B.E., R.A.M.C.(ret.), was commended by Sir Norman Moore, President of the Royal College of Physicians, by Sir Arthur Sloggett, and Sir Launcelotte Gubbins. Sir Anthony Bowlby, President of the Royal College of Surgeons of England, who was unable to be present at the meeting, has also expressed his entire approval. It was decided that photographs of the tablet, together with a plan of the Abbey showing its position, should be sent to the relatives of each person mentioned in the Golden Book, and that replicas of the memorial tablet should be given to Edinburgh and Dublin. The production of the book would, it is estimated, cost between £3,000 and £4,000. The tablet, with replicas, will cost a considerable sum, but it is not yet possible to specify the exact amount. An Executive Committee to carry out the proposals was appointed, consisting of the Director-General (chairman), Sir Norman Moore, Bt., Major-General Sir W. G. Macpherson, Sir Launcelotte Gubbins, Staff Sergeant Walton (members), and Colonel Tyrrell and Major E. B. Waggett, D.S.O., R.A.M.C.(T.F.), (joint secretaries).

RESEARCH IN RADIOLOGY.

LAST week (p. 500) the necessity for the provision of research facilities on a large scale into the properties of radium and x rays was discussed, and the present opportunities for research such as are afforded at the Radium Institute and the Middlesex Hospital were mentioned. Much of the increased opportunity for research work in radio-therapy that exists at present has arisen through the Medical Research Council, which has obtained from the Disposal Board of the Ministry of Munitions the use for a period of years of a large quantity of active radium salt for research purposes. The radium was collected from various parts of a great variety of war implements, and is of the estimated value of £72,500. The Council has prepared a scheme for the assignment of various fractions of this radium to selected centres of work where the results of its use can be adequately studied. Hitherto the opportunities of inquiry have been limited by the high cost of radium, and there has been little systematic and comprehensive study of its curative properties. There is evidence, the Council observes in its annual report for 1920, that radium used ignorantly or in improper exposures —whether too large or too small—may accelerate death instead of preventing or delaying it, and that in particular the onset of secondary malignant growths may be hastened or actually caused by unsuitable radium treatment of the primary growth. Without close study, and without the collection of adequate contemporary and later records, for which at many of the centres of work sufficient opportunity has not hitherto been found, it is impossible for these grave dangers to be detected or avoided. The Council has assigned radium fractions to a number of centres: in London, to University College Hospital, St. Bartholomew's Hospital, the Middlesex Hospital, King's College Hospital, and the Radium Institute; in Birmingham, to the General Hospital; in Dublin, to the Council for Public Health for Ireland; negotiations with other centres have been opened. Much of the research carried on during 1919 under the auspices of the Medical Research Council was conducted at the Middlesex Hospital, where elaborate precautions were taken to protect laboratory workers and nurses from the physiological effects of so large a quantity of radium; the radium, which was in the form of the bromide, was contained in eighteen tubes, which were kept in a circular brass box placed in the centre of a cubical box of lead, each edge of which measured 20 in. This leaden cube, weighing one

ton and a half, was enclosed within an iron safe as far away as possible from rooms in daily occupation. The radium box itself was never directly handled, but was moved from place to place as required by means of a "long arm" and a special lead-protected trolley; the treatment of patients was carried out in a separate room, with the aid of lead-screened apparatus. All this special apparatus was provided by the Medical Research Council. During this early stage of the investigation over one hundred patients were treated. Of these the great majority were inoperable, but prophylactic doses were given in four cases of operable carcinoma before operation. Four cases of cancer of the breast, inoperable before massive radium treatment, were subsequently considered by the surgeon to have become operable, and underwent a "complete" operation. No conclusions could be drawn from these early cases, but a remarkable diminution in the size of the tumour in cases of lymphosarcoma and lymphoadenoma was observed. Microscopical examination of bone marrow in rabbits submitted to radiation, carried out by Dr. Price Jones in Professor Boycott's laboratory at University College Hospital Medical School, showed that the behaviour of lymphosarcoma was closely paralleled by the destruction of leucocytes in the blood, spleen, and lymphatic glands of animals. The experiments on rabbits and other animals exhibited in a striking way the selective action of the rays upon particular organs of the body or particular parts. The whole of the material from the animal and human cases has not yet been examined, but microscopical examination of the brains of the animals is being made by Sir Frederick Mott in his laboratory at the Maudsley Hospital. Investigations with *x* rays have an immediate bearing upon problems of radium treatment, and the experiments regarding the general effects of small doses of *x* rays upon animals have been continued on behalf of the Council by Professor S. Russ and his colleagues at the Middlesex Hospital. Facilities were given also to Professor Sir William Bragg, of University College, for experiments in the direction of standardizing the radium radiation against that of a Coolidge tube running under known conditions. All these investigations must have a fundamental value in guiding administrations of *x* rays to patients.

ROYAL NAVAL DENTAL SERVICE.

THE new regulations governing entry into the Royal Naval Dental Service, which have just been issued, suggest that the Admiralty desires to place this newly formed branch of the service upon a sound basis. The neglect of the teeth of the personnel of the navy has been at least as bad as the neglect of the teeth among the population in general. It was only in 1892 that the first attempt was made, at Haslar, to pay any attention whatever to dentistry in the navy, and it was not until the second year of the war that the first naval dentists were commissioned as officers of the R.N.V.R. After the war was over, the nucleus of a permanent dental service for the navy was formed, and its future now depends upon the response made to the invitation conveyed in the new regulations by the young qualified dentists of the country. The qualifications for admission to the dental service are very similar to those for the medical service of the navy: A candidate must be of British birth, of sound physique, ready to engage for general service at home or abroad, and be registered under the Dentists Act. The dean, or other responsible authority, of his dental school will be requested to render a confidential report on his character and professional ability, and, after an entrance examination, which will be held twice a year, successful candidates will enter the service arranged in order of merit. Should it at any time be considered expedient to grant commissions beyond those periodically competed for, the Admiralty takes power to admit annually two candidates specially recommended by the governing bodies of such Dominion or Colonial dental centres as may be selected, on condition that they pass a qualifying test. Before a successful candidate is given a commission as Surgeon Lieutenant (D) in the Royal Navy he will be required to pass through a course of one month as decided upon by the Admiralty, and his commission will be confirmed on passing the qualifying examination at the end of this course. The subjects for the entrance examination will embrace dental surgery, including dental pathology and therapeutics, oral hygiene and oral prosthetics; candidates must obtain at least 50 per cent. of marks in each subject. A post-graduate course of three months' duration will be allowed to Surgeon Lieutenant Commanders (D) of over two years' seniority, and the officers going through this course will be accommodated at the Royal Naval College, Greenwich. This post-graduate course is designed to afford senior officers the opportunity of refreshing their general knowledge of dental surgery and making themselves familiar with modern advances. Their status in the navy is designed to be good, and "dental officers will select their cabins (all ward-room officers make such selection in order) according to their rank and seniority." The dental officer on a ship will be responsible directly to the captain. Surgeon Lieutenants (D) will receive as pay from £401 to £492; Surgeon Lieutenant Commanders (D), £593 to £730; and a Surgeon Commander (D), £775 to £912. There are to be forty-eight officers of the Royal Naval Dental Service, but of these only one can hold the rank of Surgeon Commander (D). As the service is only now at its beginning it is clearly very possible that the first officer to hold the rank of surgeon commander may retain his post for many years, thus blocking promotion absolutely. If the work of the dental service is to be carried out in the manner that everyone hopes, it is sufficiently important for an officer of the rank of surgeon commander to be stationed at each of the larger naval dépôts, and at Haslar. In this way the risk of the service becoming rather a blind alley form of employment would be avoided.

INTERNATIONAL RED CROSS CONFERENCE.

THE first session of the tenth International Red Cross Conference, which assembled in Geneva on March 30th, was occupied in listening to an interesting address by the president, M. Ador, and in the appointment of committees. It was decided that, following the precedent of the League of Nations, the Red Cross Society of a British Dominion should be admitted to the conference on an equal footing with those of other countries, and that similar recognition should be accorded to the Red Cross Society of the Netherlands Indies. Including those of Canada, South Africa, Australia, New Zealand, India and the Netherlands Indies, thirty-six Red Cross societies were represented; among them were the Red Cross societies of Germany and Austria, and the Red Crescent of Turkey; representatives of the Papal Government, of the League of Nations, of the International Labour Office, and certain societies, including the newly formed International Union for helping children, were also present. Neither the French nor the Belgian Red Cross was represented, because there are questions still open between the Governments of these two countries and Germany, and because both France and Belgium desire an assurance, described by the President of the Conference as very legitimate, that doctrines which during the war led to systematic violations of the Geneva Convention, would be disavowed. The French Red Cross, however, sent reports to this conference and expressed the hope that it might be able to be represented at the eleventh, as it had been at the ninth, held in Washington in 1912. At the second full session it was decided, on the motion of Mr. R. B. Bennett, K.C., representative of the Canadian Red Cross Society, to appoint a committee to report on the violations of the Geneva Convention committed during the war, in order that those guilty of such violations should be arraigned at the bar of

public opinion. Other commissions were appointed to prepare reports on the revision of the Geneva Convention, on the position of the Red Cross in civil war, and on the relation of Red Cross societies to Governments and to philanthropic associations. It will be remembered that a League of Red Cross Societies was organized in May, 1919, and that shortly afterwards its headquarters were established in Geneva, with Lieut.-General Sir David Henderson as Director-General. The president of the international conference was able to announce at its third meeting, on April 1st, that he and Sir David Henderson had come to an understanding with regard to the work of the International Committee of Red Cross Societies and the League of Red Cross Societies, and that this understanding had been ratified by both bodies. The Italian representative moved a resolution to issue an appeal to all the nations, calling upon them to combat the war spirit which still persists throughout the world. The resolution was supported by Dr. Livingstone Farrand, the representative of the United States, and by the representatives of Greece and Persia; it was carried unanimously. Throughout the discussions in the conference many references were made to the work which Red Cross societies can do during peace. Most of the detailed work of the conference was done by the special committees appointed, and the reports of these will not as a rule be available for some time. It is to be noted, however, that the committee on the limitation of war early arrived at certain resolutions forbidding the bombardment of open undefended towns, the deportation of the civil population, and the use of poison gases. An exhibition held during the conference included displays by the Red Cross societies of Italy, America, Sweden and Norway, and also by the Turkish and German societies.

HYGIENE OF SEAMEN.

DR. G. S. BUCHANAN, in his address on the International Health Organization to be established at Geneva in connexion with the League of Nations,[1] expressed the hope that the organization would provide a means by which competent sanitarians would take their proper part in the international regulations of matters like ship ventilation, the construction of crews' quarters, and facilities for cleansing, and also as to rations—subjects to which the International Labour Office has begun to give attention. The Town Council of Newport, Monmouthshire, in its capacity as a port sanitary authority, has issued a report, in which it expresses the opinion that the British regulations for the hygiene of crews' quarters stand in need of immediate revision. During the war the agreements between the Controllor of Shipping and those interested in the provision of better accommodation for the Merchant Service led to considerable improvements in standard ships; the report alleges that the improvements were not general and that they have not been maintained in recent vessels built for British firms. The conditions of living on vessels registered under the American flag are said to be so much better that many of the best British sailors and firemen are seeking service in American in preference to British merchant vessels. While it is admitted that many British shipowners have provided greatly improved accommodation in recent years, it is alleged that others have failed to do so. Valuable opportunities of effecting improvements in the large number of new vessels built during the last three years have been lost, and the suggestion is made that a committee should be appointed to advise the British Government as to the changes that should be made in the regulations so that this country may go to an international congress with clean hands. The proposed committee, it is thought, should contain representatives of the Board of Trade, the Ministry of Health, shipowners, ship builders, officers and men of the Merchant Service, port sanitary authorities, and the Admiralty. The question of accommodation for crews on board ship is beset with many difficulties, and can only be settled in a satisfactory manner by the frank recognition of certain basic principles which govern those conditions on board merchant ships. Sanitary methods suitable for houses on shore are not directly applicable to ships. Limitation of space in a ship must in the end influence all questions of hygiene at sea. A ship is the result of innumerable compromises between all the departments of the vessel, and any serious encroachment on space in favour of one particular department may increase expenditure to an extent the industry will be unable to bear. As it is, it is not easy to run a passenger ship at a profit, and drastic legislation may easily result in a large number of ships being laid up. Such statistics as are available do not point to any serious ill health on board ship. The rate of mortality from disease of European seamen on board steamships is 3.5 per 1,000 and that for lascars 5.4 per 1,000; these figures are below those in industrial life on shore for the same ages. As to the incidence of disease, no statistics have ever been published, and the only records available exist in the archives of those companies that have paid attention to the subject. It can, however, be stated that these records do not reveal any startling incidence of disease. It is undoubtedly desirable to ascertain the experience of medical officers of the various port sanitary authorities, but it should not be forgotten that they for the most part see only one side of the question—namely, that concerned with infectious disease—and it is to be hoped that in any attempt to grapple with this question use will be made of the experience of those who have been responsible for the health of seamen employed by the various companies. The subject has an international side; a large number of vessels change their nationality in course of time, many of them soon after completion, and an international standard of hygiene is therefore necessary. It is, of course, recognized that international agreement is necessary in dealing with the possible importation of exotic diseases, such as cholera, yellow fever, and plague. It is important, however, that international arrangements should be susceptible of revision without long delay such as ordinary Foreign Office methods usually entail. Dr. Buchanan's suggestions for short-circuiting the chancelleries—that is to say, the Foreign Offices of this and other countries—appear to us to be among the most valuable yet made.

[1] BRITISH MEDICAL JOURNAL, March 5th, 1921, p. 331.

LABELLING OF SKIMMED CONDENSED MILK.

THE Food and Drugs Act, 1899, imposes a heavy penalty upon the importation of condensed separated or skimmed milk except in tins or other receptacles which are specifically labelled and the words "separated" or "skimmed" printed in large and legible type. A fine may also be imposed upon a tradesman who sells such milk which is not so labelled. It is to be regretted that the qualification "large and legible" is so indefinite that it may be interpreted according to the desires of the interpreter. Even though there might be some difficulty in following the Margarine Act and defining the actual size of the type to be used, it would be quite simple to require that the type employed for the particular word or phrase should not be smaller than that used in any other part of the label. It is not so much the actual but the relative size of the type that is of importance. We have been led to refer to this matter as we have reason to believe that there are some brands of skimmed condensed milk the tins of which are so labelled as to mislead the purchaser although the law may be strictly carried out. A mother, therefore, may be giving her child milk which she believes to be unskimmed but which has had abstracted from it all but about 0.2 per cent. of its fat. At the instigation of Dr. Walter Bassett

this question has, we learn, been under the consideration of the Health Committee of the Newport (Mon.) Corporation, and the seriousness of the position has been brought to the notice of the Ministry of Health.

SPELLING OF CHEMICAL TERMS.

THE progress of chemical inquiry, which is constantly bringing to knowledge new substances and new theories as to the constitution and relations of various classes of substances, is apt to cause confusion in nomenclature, especially in spelling. The Chemical Society, which publishes abstracts of chemical papers published elsewhere than in its *Transactions*, and is therefore among the first to feel the inconveniences which arise, issued a short time ago instructions to abstractors, which included directions with regard to spelling of certain classes of chemical compounds. It is directed that basic substances should invariably be indicated by names ending in *ine*—as aniline, not anilin. This is in accordance with the practice of the *British Pharmacopoeia*, where alkaloids have a final "e," as morphine, strychnine. The Chemical Society directs that the termination *in* should be restricted to certain neutral compounds, such as glycerides, glucosides, bitter principles, and proteins—as, for example, palmitin, amygdalin, albumin. This rule applies to vitamin, which should be so spelt—that is, without the terminal "e." It is further directed that compounds of basic substances with hydrogen chloride, bromide, or iodide should always receive names ending in *ide* and not *ate*, as morphine hydrochloride and not morphine hydrochlorate. This rule is, we believe, now generally followed in medical writings. Another rule relates to hydroxyl derivatives of hydrocarbons, which should be designated by names ending in *ol*. Alcohols should be spoken of as mono-, di-, tri-, or n-hydric, according to the number of OH groups. Compounds which are not alcohols, but for which names ending in *ol* have been used, are to be represented by names ending in *ole*, if a systematic name cannot be given—thus, anisole not anisol, indole not indol.

MINERS' HOUSING.

THE National Housing and Town Planning Council issues a weekly record for the benefit of the Housing Committees of local authorities. The current issue, describing the garden suburb now being developed by the Bristol City Council at Sea Mills, and the scheme of the London County Council for a new town at Beacontree in Essex, makes timely allusion to the housing of miners. With the recrudescence of difficulties in the mining industry, it says, deep interest will be taken in the view expressed by many responsible and unbiassed public men to the effect that a substantial part of the unrest to be found in mining districts—and more especially in the coal valleys of South Wales—is due to the absence of proper conditions of social life and of suitable housing conditions. "At its best, the mining village or town is not a thing of beauty. At its worst, the colliery slum, with its wellnigh primitive sanitary conditions and rows of back-to-back houses, can 'give points' to many of the worst slums of great industrial centres." It is alleged that the number of employers willing or able to take remedial action is small. One or two examples are then quoted to show that here and there the right kind of action is being taken; these, however, are said to be exceptional cases. "It is recognized by employers and colliery workmen alike that the task of providing homes for miners under happier conditions can only be adequately fulfilled by local authorities acting in co-operation with the State." Even now, however, nearly 100,000 houses are included in the building programmes of the local authorities for the various mining areas of England, Wales, and Scotland. It is said that the idea is rapidly growing amongst employers and workmen that it is not good for those engaged in the mining industry to be segregated in villages and towns given over entirely to the housing of workmen engaged in coal mining. The Committee of the South Wales Regional Survey is understood to favour the development of fifteen new towns in the colliery valleys of South Wales, under such conditions that the miners may partake of the amenities of civilized life and live in closer touch with other members of the community. There is a great deal of truth and a certain amount of exaggeration in all this. In any large area where the greater part of the coal raised is exported to foreign countries, or even sent to other parts of our own country—and this is the case in large areas of the South Wales coal fields—it would be difficult to form communities containing any large proportion of persons engaged in other industries than the raising of coal. Nor are we at all sure that the task of providing homes for miners under happier conditions can only be adequately fulfilled through State help, or that the majority of employers are indifferent. It is perhaps not generally known that large anthracite areas are being taken up in South Wales. A cursory observation of the new towns erected or planned shows that they are free from the gross defects of the aggregates of houses that choke the valleys of the Rhondda district. The risk of such utterances as those of the Housing and Town Planning Council is that they may encourage both mine owners and miners to believe that it is hopeless to make a mining town or village a reasonably agreeable place to live in unless other industries than the raising of coal are there carried on.

TREATMENT OF TUBERCULOSIS.

IN accordance with that section of the National Health Insurance Act, 1920, which provides that sanatorium benefit shall cease to be included among the benefits of the National Insurance Act, 1911, after April 30th next, county and county borough councils have now received a circular letter from the Ministry of Health. It is pointed out that it will rest with these councils to provide institutional treatment for insured persons as well as for other members of the community, as Insurance Committees will after that date no longer have the duty of providing such treatment for insured persons suffering from tuberculosis. In practically every county and county borough a scheme for the institutional treatment of tuberculosis, comprising both dispensaries and residential institutions, is already in preparation or in course of development, and is available for the treatment of the whole population of the area. In the large majority of the areas agreements are also in operation by which the councils provide institutional treatment for insured persons suffering from tuberculosis in consideration of payments by the Insurance Committees. These agreements will come to an end when sanatorium benefit is discontinued, but in those areas in which the council has already undertaken by agreement with the Insurance Committee to provide institutional treatment for insured persons, no difficulty should arise in continuing provision by the council of the institutional treatment needed by such persons. In the remaining areas it will be necessary for the council to supplement the provision already made, either by taking over the arrangements made by the Insurance Committee for the provision of residential treatment, or by making other arrangements for that purpose under which an equivalent amount of residential treatment will be provided; there must of course be no interruption of the course of treatment provided by an Insurance Committee for any insured person. A separate memorandum has been issued dealing with the special arrangements which should be made by a council for the treatment of ex-service men suffering from tuberculosis. Provision is made for repayment to the council of the cost of residential treatment provided for ex-service men; the special services tuberculosis officers should render in relation to pension

administration are set out, and a new method of payment by the Ministry is formulated. By the National Insurance Act, sanatorium benefit of seamen and other persons employed in the mercantile marine suffering from tuberculosis was administered by the Seamen's National Insurance Society instead of by an Insurance Committee. A sum equivalent to the annual amount at present available for providing institutional treatment by that society will be distributed among the councils of those areas in which the society's members are located, and it is necessary that, as the majority of seamen have no permanent place of residence, cases of tuberculosis should be dealt with by the councils as a matter of urgency. As insured persons will no longer be in a position to apply to their Insurance Committees for sanatorium benefit after April 30th, cases of such persons and of other members of the community suffering from tuberculosis should be brought to the notice of the local tuberculosis officer at the earliest possible date, and it is suggested that councils should again circularize the medical practitioners practising in their areas drawing attention to the importance of utilizing freely the services of the local tuberculosis officers.

SIR WILLIAM THORBURN.

THOUGH Sir William Thorburn retired at the end of last year from the active surgical staff of the Manchester Royal Infirmary rather before the date required by the age limit rule, and in consequence ceased to be professor of surgery in the Manchester University, he has not given up teaching nor the practice of his profession. Since his election to be consulting surgeon he has been appointed to give lectures on the surgery of the nervous system at the Manchester Royal Infirmary; the first series will be given there during June next. Sir William Thorburn is at present in Rome, whither he went as president of the British Chirurgical Club, which exists to enable its members to study surgical methods of other schools and other countries. Sir William Thorburn's reputation as a surgeon is particularly high in the department concerned with the treatment of diseases and injuries of the nerves, and the profession, especially in the north of England, will be glad to know that it is not to be deprived of his experience and skill.

DR. THOMAS LEWIS, F.R.S., will deliver the Oliver-Sharpey lectures before the Royal College of Physicians of London, at 5 p.m., on Tuesday, April 12th, and Thursday, April 14th, at the College, Pall Mall East. The subject is: "Observations upon the nature of auricular flutter and fibrillation."

THE Right Hon. Evelyn Cecil, M.P., has retired from the office of Secretary-General of the Order of St. John of Jerusalem, and has been succeeded by Lord Stanmore. Mr. Cecil had held this, the chief executive office of the Order of St. John, since 1915. He became a member of the Joint War Committee of the British Red Cross Society and the Order of St. John five years ago, and has been vice-chairman of the Joint War Council for the last two years.

ON Friday, April 15th, at 5 o'clock, in the Museum of the Royal College of Surgeons of England, Professor Arthur Keith will demonstrate specimens illustrating the comparative anatomy of the caecum, appendix, and great bowel.

AT a meeting of the Central Midwives Board for England and Wales held on March 23rd, with Sir Francis Champneys presiding, one midwife was struck off the roll, one severely censured, two put on probation for reports in three and six months, and one case was dismissed, the midwife being cautioned to obey the rules strictly. Various appointments were made to fill vacancies caused by the resignation of examiners, and lists of examiners, lecturers, and institutions, homes, and midwives, at which and under whom pupil midwives may be trained, were approved.

Medical Notes in Parliament.

[FROM OUR PARLIAMENTARY CORRESPONDENT.]

The Ministerial Changes.

THE reconstruction of the Ministry, which has followed upon the retirement of Mr. Bonar Law and upon the occurrence of other vacancies, has brought numerous changes in the placing of members of the Government, and a small and valuable infusion of fresh blood. The list has been made familiar through the daily papers, and need not be referred to in detail here, except as regards the departure of Dr. Addison from the Ministry of Health and the selection of Sir Alfred Mond to fill that office. The fact that Dr. Addison remains a member of the Cabinet as a Minister without portfolio—that is to say, in a consultative and influential capacity—shows that he enjoys in a high degree the confidence of the Prime Minister; and inasmuch as under the Coalition arrangement the Cabinet appointments are—figuratively speaking—countersigned by Mr. Austen Chamberlain as leader of the Unionist party, there is evidence that Dr. Addison is also held in appreciation by the Unionist chief.

It may be assumed that the selection of Sir Alfred Mond is due mainly to the desire of the Prime Minister to have at the Board of Health a commercial man with better business qualifications than Dr. Addison, in the nature of his career, could possess for dealing with the housing problem, which is causing so much anxiety at the present time. Sir Alfred Mond had much experience during the war, as First Commissioner of Works, in arranging for the accommodation of emergency war services, and even in the ordinary way the position he has now given up to become Minister of Health afforded him special knowledge in this connexion. His wide responsibilities in chemical manufactures before he entered the Government trained him, moreover, to think largely and to estimate closely on these subjects. His capacity for handling big figures was shown also during fiscal controversies in pre-war days.

Happily there is no reason to fear that because Mr. Lloyd George's choice has been determined principally by the housing situation Sir Alfred Mond will be lacking in concern to take up health questions, or will fail in capacity or vigour in handling them. At the works of Messrs. Brunner, Mond at Droitwich and elsewhere keen anxiety has been manifested to recognize the importance of hygiene. Indeed, the nature of some of the undertakings has called for much care, and the directorate are proud of the scientific administration which has given such good results in the physical condition of the employees. With this record at the back of his mind, Sir Alfred Mond will, it is anticipated, desire to continue and promote a forward movement at the Ministry of Health in all things affecting the well-being of the people, and be sympathetic to the medical profession.

The new Ministers are generally considered to have been well chosen. There is satisfaction that at last the Air Ministry obtains a directly responsible head; to this work Captain Guest will bring energy and enterprise. Commander Hilton Young, who succeeds Mr. Baldwin as Secretary to the Treasury, has amongst private members shown himself far and away the ablest debater on financial subjects that recent years have produced. He doubtless gained some strength from experience earlier as the city editor of a London journal. Sir Robert Sanders, who was the right hand of Lord Edmund Talbot in the Whip's office, should prove highly capable as Under-Secretary for War; he is none the less efficient because he has shunned the limelight of politics. Major the Hon. E. F. L. Woods, the eldest son of Lord Halifax, has distinguished himself as a thoughtful and careful speaker, and his broad interests will find opportunity for service in the Under-Secretaryship for the Colonies. Altogether the juniors look likely to justify their selection.

The Bradford Municipal Hospital.—Mr. George Thorne asked the Minister of Health, on April 5th, whether he could state the present position in regard to the acquisition of a Poor Law infirmary by the Bradford Corporation, to which he had at one time given his sanction, which assent, Mr. Thorne understood, was afterwards withdrawn. Sir Alfred Mond replied that provisional sanction was given to the scheme in June last, and this had never been withdrawn. But before giving a final decision the Minister of Health had urged on the Council the importance of full consultation with the medical profession in Bradford. As the result of this, a local advisory medical committee was appointed, and this committee had put forward certain suggestions which were being considered by the City Council, from whom a communication was expected to be received soon.

England and Wales.

SUPPLY OF MILK TO NURSING MOTHERS.

A CIRCULAR has been addressed to local authorities by direction of the Minister of Health stating that, in the supply of milk for expectant and nursing mothers and children under five years of age, many local authorities have incurred expenditure very greatly exceeding what is either necessary or desirable. This conclusion has been reached after a careful review of the cost of the schemes adopted throughout the country by local authorities with comparable needs. The Minister has accordingly reconsidered the arrangements to be observed as a condition of his sanction to schemes, and it appears to him that the necessities of those whom the service was designed to benefit could be met by a much lower rate of expenditure than that now being incurred. The Milk (Mothers and Children) Order, 1919, made by the Food Controller and the local authorities, and the Milk (Mothers and Children) Order, 1919, made by the Minister of Health, have therefore been revoked, and local authorities must in future obtain the sanction of the Minister of Health under the Maternity and Child Welfare Act, 1918, to schemes for the supply of milk to expectant and nursing mothers and children under five years. Milk may be supplied at less than cost price in necessitous cases only to (*a*) nursing mothers; (*b*) expectant mothers in the last three months of pregnancy; (*c*) children up to three years of age, and exceptionally to children between three and five years of age. The quantity of milk supplied at less than cost price must not ordinarily exceed one pint a day for each person, but in exceptional cases one and a half pints may be supplied for infants from three to eighteen months. Milk should be given only where the medical officer of health is satisfied that it is essential on grounds of health, and for exceptional cases a medical certificate will be required. A special committee should be appointed locally to lay down the procedure for dealing with applications for milk and to review all authorizations for supply. Reasonable steps must be taken by local authorities to verify the particulars of income given by applicants, and to prevent overlapping with other bodies concerned. Where dried milk or preparations of milk are used the quantity should be such as would, when reconstructed, approximate to the usual supply of fresh milk.

JOINT MEDICAL MEETING AT SHEFFIELD.

A joint meeting of the Sheffield Medico-Chirurgical Society and the British Medical Association was held on March 24th in the Firth Hall of Sheffield University, and the chair was taken by Dr. F. J. Sadler. Dr. Rupert Hallam gave a short account of his journey round the world as the medical member of a Commission which was dispatched to the Far East by the National Council for Combating Venereal Diseases with the approval of the Colonial Office. The Commission first visited New York, arriving there early in November, 1920, where Dr. Hallam had the opportunity of seeing several of the well known skin and venereal clinics. The majority of patients there pay for their treatment, but necessitous patients are able to obtain free treatment. Compulsory notification and treatment of venereal disease has been in force for more than a year, and the consensus of opinion is that this has not acted as a deterrent to patients to seek treatment. He next visited the New York State Laboratory at Albany, which is a large and well-equipped building. The Commission journeyed across Canada, making brief stays at Toronto, Winnipeg, Regina and Victoria, where meetings were held under the auspices of the Canadian Council for Combating Venereal Disease. In Japan useful information was obtained from the officials of the Government Health Department, and visits were paid in two hospitals in Tokio. At the invitation of the Shanghai Municipal Council the Commission conducted a campaign of public enlightenment in that city, and Dr. Hallam gave a series of lectures and demonstrations to the medical practitioners there in the diagnosis and treatment of venereal disease. The incidence of both syphilis and gonorrhoea among the Chinese in the seaport towns is very high, and before the visit of the Commission there was no treatment by modern methods available for them. The Commission conducted a similar campaign at Hong Kong, Singapore and Colombo, and in each of these ports recommended that the free diagnosis and treatment of venereal disease should be provided.

Ireland.

THE LATE DR. J. A. HANRAHAN.

WE have received the following appeal, signed by Dr. James W. O'Connor, Professor of Physiology, University College, Dublin, and Mr. W. Doolin, M.B., F.R.C.S.I., Honorary Secretary of the Leinster Division of the British Medical Association, who write from 50, Fitzwilliam Square, Dublin:

"We ask the liberty of appealing through your columns on behalf of the widow and children of the late Jas. A. Hanrahan, M.B., a recent Dublin graduate. Dr. Hanrahan graduated in the Royal University in 1909; shortly after he went abroad to take up practice in Australia, from which country he returned home last year, to die of inoperable rectal cancer at the early age of 34. Unhappily he was too short a while in practice to make any effective provision for his family. His unhappy widow, herself seriously handicapped by reason of deafness, is now left with four young children to maintain. In these circumstances we would now appeal to your members and readers for any measure of assistance, however small, that they can afford. Subscriptions, which will be duly acknowledged, may be sent to either of us."

Scotland.

VITAL STATISTICS FOR 1920.

THE outstanding statistical facts derived from an examination of the annual report for 1920 of the Registrar-General for Scotland are high birth and marriage rates and a low death rate. The marriage rate, 9.6 per 1,000, is the highest Scottish marriage rate yet recorded, while the death rate, 14.0, is the lowest. The birth rate was 28.1, and is higher than that of all years since 1906. Deaths from tuberculous disease show a satisfactory decline. Deaths from whooping-cough were fewer than in any previous year, and those from measles also declined. Births registered in Scotland during the year numbered 136,535; this was 30,267 more than in the previous year, 31,258 more than the mean of the numbers of the preceding five years, and 22,599 more than the mean of those of the preceding ten years. It is the largest number of births registered in Scotland in any one year, the previous largest number being in 1903. The increase was due to large numbers in the first two quarters of the year only, there being no marked excess over pre-war averages in those of the latter two quarters. Deaths registered numbered 68,179, or 6,970 less than in the previous year, 6,876 less than the mean of those of the five preceding years, and 5,643 less than the mean of the ten preceding years. It is less that the number registered in any year subsequent to 1862. The natural increase of the population of Scotland during the year (the excess of births over deaths) was 68,356, a number greater than in any previous year since the institution of national registration—that is, since 1855. The birth rate was 28.1 per 1,000; it was 6.4 higher than that of the previous year, and higher than the rate of all years subsequent to 1906. The annual death rate was 14 per 1,000; it was 1.4 less than that of the previous year, and 1.5 less than the mean of those of the preceding ten years. It is the lowest annual Scottish death rate yet recorded. The deaths of children of less than 1 year old numbered 12,565, equal to an infant mortality of 92 per 1,000 registered births. This rate is 10 less than in the previous year, 15 less than the mean of the preceding five years, and is the lowest annual Scottish infantile mortality rate yet recorded. The death rate due to the principal epidemic diseases was 0.78 per 1,000. This is 0.14 less than in the previous year. The death rate from all forms of tuberculous disease was 124 per 100,000, and from phthisis 86. Both of these rates were the lowest yet recorded. Deaths from small-pox registered during the year numbered 152, which is the largest number in any year since 1904. Deaths from measles were fewer than

in any year since 1894, while from whooping-cough they are fewer than in any previous year. Deaths from cancer were more numerous than in any previous year; they outnumbered those attributed to phthisis by 1,563, or fully 37 per cent.

END OF GLASGOW SMALL-POX EPIDEMIC.

The last case of small-pox in Glasgow has now been discharged from hospital, and the city for the first time in twelve months is free from this disease. The epidemic started in March of last year, and altogether the Public Health Department dealt with 576 Glasgow cases and 26 cases from Rutherglen burgh and the County of Lanark. Of the total cases 119 proved fatal, the deaths without exception occurring among patients who had never been vaccinated or who had not been vaccinated for a considerable number of years. The disease was at its height towards the end of May, when there were 157 cases in hospital at the same time. About a quarter of a million persons were vaccinated by the officials of the Health Department, assisted by a large number of medical students, and the education authority carried out a systematic campaign of vaccination in the schools.

Correspondence.

ACIDOSIS AND ALKALOSIS.

SIR,—In his letter in the BRITISH MEDICAL JOURNAL of April 2nd Dr. Poulton suggests that what is known as diminished or increased "alkaline reserve" of the blood should be called "acidosis" or "alkalosis," regardless of whether the actual reaction of the blood is altered in the acid or alkaline direction. I feel sure that nothing but confusion could result if such a nomenclature were adopted; and mistakes have actually arisen in the past through taking variations in the "alkaline reserve" as in themselves an index of whether the blood is altered towards the acid or alkaline side. I need only instance the case of treatment of lung-irritant gas-poisoning by administration of alkalis, in disregard of the urgent danger from anoxaemia.

It is now clearly established that, as was illustrated in my lecture, the "alkaline reserve" may be, and often is, diminished in cases where the blood is abnormally alkaline; and conversely that the "alkaline reserve" may be increased where the blood is deficient in alkalinity. The expression "alkaline reserve" is an unfortunate one, in so far as it suggests the existence of a reserve of alkali beyond what is required to maintain a normal reaction. In actual fact the whole of the normal "alkaline reserve" of the blood is required to balance the carbonic acid normally present. When less or more carbonic acid than usual is present the "alkaline reserve" is gradually diminished or increased to such an extent as nearly to restore, if possible, the normal reaction. Conversely, if the "alkaline reserve" is increased or diminished the carbonic acid in the blood is, by diminution or increase of the breathing, so increased or diminished as, if possible, nearly to restore the reaction.

An instance of diminution in the carbonic acid of the blood, with consequent diminution in its "alkaline reserve," is furnished wherever increased breathing is caused by anoxaemia. An instance of diminution in "alkaline reserve," with consequent increased breathing and diminution in the carbonic acid in the blood, is afforded by any case in which acids accumulate abnormally in the blood. This occurs to an extreme extent in diabetic coma, of which the phenomena seem to me to point very clearly to a condition of extreme acidosis, along with secondary damage where the condition has lasted for some time, just as there is secondary damage when anoxaemia has lasted for some time.

For "alkaline reserve" one might substitute some such expression as "CO_2-combining capacity"; but probably the more picturesque expression "alkaline reserve" will survive, as it is now so extensively used. To define acidosis or alkalosis as diminution or increase in "alkaline reserve" is, however, so definitely misleading that I feel sure that such a definition ought to be avoided. Acidosis and alkalosis are extremely small, but also extremely important, deviations from normal in the hydrogen ion concentration within the body. The available direct physical and chemical methods are still too rough to enable us to follow these deviations closely; but we can do so by the far more delicate method of observing the accompanying changes in breathing and in the excretion of acid or alkali and ammonia by the kidneys.—I am, etc.,

Oxford, April 3rd. J. S. HALDANE.

CARDIAC PERISTALSIS AND MITRAL STENOSIS.

SIR,—In his thoughtful paper on "Cardiac peristalsis and mitral stenosis" Dr. Samways brings out an important fact in connexion with the mechanism of the heart beat—namely, that during the initial phase of closure the semilunar valves are supported by contracted ventricular muscle, and the auriculo-ventricular valves by contracted auricular muscle.

Some years ago I drew attention to the incompetence of the aortic semilunar valves to support the aortic blood pressure, emphasizing this incompetence by asking what would happen if a portion of the aortic wall were replaced by semilunar membrane. Obviously rupture would speedily ensue. I suggested that during the early phase of semilunar closure the ventricular wall adjacent to the valves remains contracted, thus affording the closed valves the needful support until such time as the rising intraventricular pressure is adequate for the purpose. This explanation has since been established as a fact. Presumably the same line of argument applies to the auriculo-ventricular valves, though the conditions in their case are somewhat different.

Curious that so glaring a fact as the incompetence of semilunar tissue to sustain for a century or more rhythmical pulsations of 100 Hg pressure should have escaped the physiologists. Modern textbooks on physiology still overlook it. Other essential truths in connexion with the circulation are similarly neglected. Indeed, I make bold to assert (what may perhaps shock, but I trust will not offend, the professed physiologist) that it is not possible to get a proper insight into the physiology of the circulation from any modern students' textbook of physiology—at least not from any I have consulted.

Here, for example, are a few among several fundamental points wholly ignored in these works, although an understanding of them is essential for a proper understanding of the circulation: the meaning of the great excess of the aortic over the pulmonary blood pressure (how comes it, for example, that the aortic pressure of the mouse is greater than the pulmonary pressure of the horse?); the object of the muscle tissue in the aorta and other large blood vessels and in the veins; its abundance in the veins of the lower limbs; its scantiness in the veins of the neck and its entire absence in the intracranial, interosseous, and intraocular veins.—I am, etc.,

London, April 3rd. HARRY CAMPBELL.

THE FUTURE OF RESEARCH IN TROPICAL MEDICINE.

SIR,—I much regret if in my recent address I have done any injustice to the Committee for the Prevention of Tropical Diseases through inadvertently using the word "island" in the singular instead of the plural, although it in no way affects the principle for which I was contending—namely, that the time has come for a further advance in the way of establishing more permanent research laboratories in British tropical possessions rather than in sending out further expensive temporary expeditions.

I am surprised at Dr. Jensen's statement that I should have been welcomed at his committee's meetings, considering I received no notice of them, and in view of the fact that I have waited in vain for six months for any reply to my letter to him setting forth the views I expressed in my recent address and offering to join the committee if at any time they adopted the policy I advocated. As a matter of fact, one of the two copies of the circular he sent me was not marked "proof" or in any way as confidential, while judging from the long list of members of the committee, scattered all over the world, to whom it had presumably been sent, it never occurred to me that the committee did not think it wise to allow their policy to see the light of day. The decision as to which is now the better policy may safely be left to the real arbiters—the holders of the purse-strings.—I am, etc.,

London, W., April 4th. LEONARD ROGERS.

THE COLLECTIVE OPINION OF THE PROFESSION.

SIR,—I should like to support the letter of Dr. Fothergill in this matter (BRITISH MEDICAL JOURNAL, March 5th, p. 362), and hope that the Council will accept and act upon the suggestion of a questionnaire. I especially want to see the formation of a committee of medical men who should represent the views of the medical profession and the medical profession alone, and one which should not profess to promote the interests of the community rather than those of the medical practitioners engaged in active practice. If the large number of medical men at present outside the British Medical Association could only be convinced that these two objects could be attained, I feel sure that the Association would soon be invincible and absolutely beyond the caprice of bureaucracy.—I am, etc.,

S. NOY SCOTT.

Plymstock, S. Devon, March 28th.

EVOLUTION IN RELATION TO DISEASE.

SIR,—Your first leader in the issue of the BRITISH MEDICAL JOURNAL of March 19th, on the new epidemiology, induces me to write the following remarks. In a contribution to the Epidemiological Society of London on March 16th, 1906, on the above subject, I opened with the statement that

> "there are times when it is essential for real progressive knowledge that we should pause and contemplate the discoveries already made and the knowledge already achieved. The pure scientist is by nature cautious—so cautious, indeed, that if he alone were to deal with the problems of science progress would naturally be slow. Many a biologist has looked at but not recognized under his microscope some organism of high importance which later has been readily perceived by a more philosophical observer who has allowed analogy and deduction to influence his researches."

When I read a paper on "The evolution of disease and disease germs" at a Public Health Congress at Eastbourne in July, 1901, a well-known medical officer of health—who subsequently achieved the highest distinction—denounced my deductions as "dangerous." (His latest writings reveal that he is a convert.) Another well-known medical officer of health stigmatized my suggestions as "absurd." At that time I advanced my arguments as the results of my own bacteriological observations and cogitations thereon when demonstrator of bacteriology at King's College, University of London, and was unaware of any previous philosophical reasoning on the subject. But I shortly afterwards learned that I was in good company—both as regards the thesis I advanced and the sarcasm and antagonism with which it was received—in the person of Sir William Collins, who had enunciated similar views in a letter to the *Lancet* of May 14th, 1881, which had been ridiculed even by the medical press. My contribution to the Epidemiological Society in 1906 met with a kinder reception, and gave rise to a valuable discussion opened by the late Dr. Payne, whose reputation as a scientific pathologist was well founded. Those interested in evolutionary pathology will find in his remarks a most entertaining and picturesque application of the Darwinian system to disease processes.[1] Only so recently as last year Sir William Collins contributed a historical retrospect on "Specificity and evolution in disease," dating back to his original letter of May 14th, 1881.[2]

In the course of the discussion on my paper in 1906 Dr. W. H. Hamer, remarking that, while my views were somewhat unorthodox, I had submitted my thesis to a tribunal likely to give it careful and sympathetic consideration, did great service in reviewing previous evidence of interest on the part of members of the Epidemiological Society on the relationship between scarlet fever and diphtheria, such interest dating back to remarks by Dr. Burdon-Sanderson in 1858–59, when a Diphtheria Subcommittee was appointed. A point specially considered by this committee was the extent to which epidemics of diphtheria had been coincident in place and time with epidemics of scarlet fever. Dr. Ransome, in 1875, attached importance to two points as showing that diphtheria and scarlet fever were not identical—one of his objections was that, whereas scarlet fever was milk-borne, diphtheria was not; the other was that diphtheria was commonly spread by sewer air, not so scarlet fever. Both objections are now anachronisms.

In my paper I devoted especial attention to the bacteriological side of the problem, commenting on the frequent association of streptococci, Hoffmann's bacilli, and Klebs-Loeffler bacilli in the swabbings of throats from both scarlet fever and diphtheria patients, and I still hold the view, as suggested in the BRITISH MEDICAL JOURNAL, 1902, vol. i, p. 56, that these organisms, thought by many to be well-defined "species," are interchangeable varieties in the life-history of a common saprophytic organism which has passed through evolutionary phases on different lines, giving rise under certain conditions to an organism which, in susceptible persons, brings about reactions recognizable in the form of a clinical entity known as scarlet fever; while under other evolutionary conditions the organism becomes what is known as Klebs-Loeffler bacillus, with reactions in susceptible persons inducing a clinical entity recognizable as diphtheria. But betwixt definite scarlet fever and definite diphtheria are many less definite clinical conditions; many of these are associated with what is known as Hoffmann's bacillus. In the later stages of both scarlet fever and of diphtheria Hoffmann's bacillus is frequently found as the principal organism in throat swabs. I have observed elements in a chain of streptococci assuming bacillary forms. Once again I repeat what I said in 1902: "True scientific instinct should bear in mind the perturbing influences of evolutionary factors in disease." I cannot here more than mention the probabilities of a common ancestral stock for puerperal fever, erysipelas, rheumatic fever, scarlet fever, and diphtheria; or of a similar common ancestral saprophytic original organism for the various typho-coli races of bacteria and their resulting fevers; or of another for measles, small-pox, alastrim, varicella, and vaccinia.

In addition to the bacteriological side there are sides of the problem both important and interesting, such as the epidemiological relationship which Dr. Longstaffe pointed out between seasons of drought and scarlet fever, diphtheria, etc. It is now known that both diseases may be spread by milk and school attendance, and in both diseases "return" cases are not infrequent.

In my reply to the discussion on my paper in 1906 I laid stress on the importance of symbiotic relationship in individual throats; in some favourable, in others inimical to the evolution of function and even of morphology. Such can be studied only by sustained observation of cultures made from *daily* swabs of the particular throat in question. This was my special method of observation, having a fever hospital and bacteriological laboratory at command. The only likely method of demonstrating such observations to others would be by calling in the aid of photomicrography.

Now that evolutionary pathology appears to be coming into its kingdom it is appropriate once again to draw attention to the monumental and hitherto unaccepted scientific work of the late Dr. Charlton Bastian dealing with archebiosis and heterogenesis. It is highly probable that all bacteria are merely stages in the extremely complicated cycle of low forms of life.

How history repeats itself, even in the advancement of human knowledge, may be realized by a careful reperusal of Darwin's historical sketch of the progress of opinion on the origin of species previously to the publication of the first edition of his celebrated work. Thus we may go back a hundred years to find the real pioneers of evolutionary pathology, and to learn that even then thoughtful men had been forced to the conclusion that "species are only a higher and more permanent (or stable) class of varieties." How seldom can lowly bacteria achieve and maintain such permanency! How extremely probable that therefore there should be such variation in disease—sometimes malignant, at others so mild as to create doubt whether the epidemic illness prevalent is to be called scarlet fever, or influenza, or Dunn's disease, or "fourth disease," or "new disease."

The publication of my book on *Evolution and Disease* brought me copies of interesting and instructive papers by distinguished American authors. Among others, one on variation in type of infectious disease as shown by the history of small-pox in the United States, 1895–1912, by Charles V. Chapin.[3] The evidence pointed to the existence

[1] *Transactions* of the Epidemiological Society of London, vol. xxv, 1905–1906, p. 231.
[2] *Lancet*, 1920, i, p. 1059.
[3] *Journal of Infectious Diseases*, September, 1913.

in North America during this period of two distinct strains of small-pox, both tending to breed true, though it was possible that a few outbreaks of the severe type may have developed from the mild type which received a great variety of names—Cuban itch, army itch, bean itch, dhobie itch, cedar itch, African itch, Spanish measles, Japanese measles, bean-pox, water-pox, etc. A similar mild type of small-pox in England occurred in 1919. Of a more speculative nature is the highly interesting presidential address to the Connecticut State Medical Society, delivered by Dr. Stephen J. Maher in May, 1915.—I am, etc.,

Norwich, March 31st. J. T. C. NASH.

BOVINE TUBERCULOSIS.

SIR,—At a recent discussion of the Royal Society of Medicine on the "Eradication of tuberculosis in man and animals," Professor Lyle Cummins is reported to have said he could not free his mind from feeling that it (partial vaccination by a bovine strain and prolongation of the disease in the class of case in which milk might be concerned, the middle-aged type) did exist, although he would regard the advocacy of such vaccination as entirely unjustifiable.

He would therefore, I imagine, believe that for this end to be attained bovine tuberculosis must have been on the increase during the past fifty years, the period in which human tuberculosis has shown such a marked decline. The opponents of the immunity theory would probably consider that bovine tuberculosis had also declined during this period, a supposition which seems just as probable as the other.

Are there any statistics in existence relating to the incidence of bovine tuberculosis during the past fifty years? I imagine not. If there were, they would be interesting with reference to the question of immunity. Infancy and childhood are the periods of life in which the largest quantities of milk are consumed, but until the present century these were the age periods in which, to quote the report of the Registrar-General, "the fall of mortality amongst young children has previously lagged somewhat behind those at most, and for females at all ages."

Childhood and the earlier adult years of life are also those in which the infectious illnesses mostly occur, and during these illnesses increased quantities of milk are taken. In these age periods also the non-pulmonary and bovine forms of tubercle are most prevalent.

The dose of bacilli in milk at any time must be x, but this being understood the following questions may be put. If this partial immunity exists, when does it begin to develop, when is it most potent, and when does it begin to decline? Surely it ought to be most potent in childhood and gradually become less dominant, yet Professor Lyle Cummins suggests that it has most influence in the middle-age type of disease, and not with the young adult type.

Whatever views may be held as to the benefit or danger of the consumption of tuberculous milk by children, I have never yet met anyone who suggested that the drinking of such milk by adults was an advantage to the consumer. If it were so, in the opinion of those who believe in partial immunity, it would be an argument against attempting to diminish the incidence of bovine tuberculosis.—I am, etc.,

Guernsey, March 29th. H. D. BISHOP.

ADRENALINE IN RESUSCITATION.

SIR,—The valuable letter of Mr. Lockhart-Mummery on p. 100 of the JOURNAL on January 15th may appeal to more of us than he seems to think.

Surely he makes too much of his dilution of adrenaline to 1 in 50,000 before administration. Experimental physiologists have long recognized with regard to intravenous administration that dilution of drugs with the blood can be secured to any extent by slowness of injection. That Mr. Lockhart-Mummery found by his observations that 1 in 50,000 was the optimum dilution of adrenaline means no more than that it was the optimum at the rate at which he injected; no two operators would inject at the same rate and so secure the same dilution in the general circulation, however constant the contents of their syringes were.

The "person skilled in the use of adrenaline transfusion," the necessity for whose presence Mr. Lockhart-Mummery considers such a grave limitation of the scope of the procedure he advocates, need be no other than any one of us who is accustomed to using a 10 or 20 c.cm. syringe for intravenous medication.

It is this recognition that the blood is the best diluent that has changed the intravenous administration of quinine—for example, from being a procedure for those "skilled in transfusion" to being a matter of an intravenous injection easily within the competence of any tropical practitioner. Provided he takes the precaution of adding m_{v} of liquor adrenalini to his solution, and of injecting slowly, he can avoid the one danger of intravenous injection of quinine—that of a drop in the blood pressure. The tetanus spore, the bogey of the intramuscular method, he may leave to be dealt with by the leucocytes; and his patients never remind him of his intravenous injections of quinine as they did of his intramuscular ones, followed so often by painful lumps dotted about just the parts of the body they wanted to lie on.

Intravenous medication is still in its infancy. Used with discretion it has a great future before it; and it is a distinct encouragement to its use, when indicated, that it is the one way of giving medicine which demands no accuracy of dilution in dispensing. The practitioner has only to judge, say, how many grains of quinine or urotropin or how many minims of tincture of iodine he wishes to administer; he gives this in the nearest available syringe, without regard as to whether it be a 5 or a 10 c.cm. one, and in injecting he presses the piston very slowly, thus further diluting his drug with the most abundant, handy, cheap, and surely sterile saline solution he could use.

If Mr. Lockhart-Mummery, out of his experience, will tell us what is the dose of liq. adrenalini hyd. (*B.P.*) to use in order to have the best chance of restarting a human heart that has stopped beating, we can do the rest.—I am, etc.,

J. L. MARJORIBANKS, M.D., D.P.H.,
Aden, March 13th. Lieut.-Colonel I.M.S.

IRRITABLE BLADDER.

SIR,—Dr. Hamilton, in the JOURNAL of March 26th, p. 480, asks for information with regard to modern methods of treatment of irritable bladder. In true "irritable bladder," which is associated with frequent micturition, pain, normal urine, painless and elastic bladder walls, faradism, as advocated by my father, the late Dr. Samuel Sloan of Glasgow, gives most satisfactory results.

I have employed this treatment according to my father's directions. "An intrauterine bipolar electrode is introduced into the bladder with the usual antiseptic precautions. The current is taken from the secondary coil, the sedative form of current being thus employed." A dose of 2 to 3 milliampères for fifteen minutes, given on alternate days for ten or twelve treatments, will suffice for cases of irritable bladder, but a second course of treatment may be necessary in those cases associated with injury to the bladder from pressure during parturition, with paresis of the sphincter.—I am, etc.,

London, W., April 4th. ELIZABETH SLOAN CHESSER, M.D.

CHRONIC RETENTION OF URINE ARISING FROM PROSTATIC DISORDER.

SIR,—In reply to Mr. Clayton-Jones (March 19th, p. 441), may I point out that my paper of March 12th dealt with the treatment of only one of the symptoms of prostatic disorder—namely, that of retention—and not of others which may arise from the same cause—for instance, nocturnal vesical irritation? In this case the affected glands within the prostate are so situated that they stimulate the area of reflex, thereby giving rise to a more frequent desire to micturate, though they are not as yet large enough to produce increased resistance in the prostatic urethra.

Nocturnal vesical irritation is often the forerunner of retention, though it is by no means a sure sign of its oncoming, for most men after middle life are more or less thus troubled, but, if tested, have no residual urine. Further, the symptom may, and often does, continue after retention has occurred. The desire to micturate is more

marked at night owing, I believe, to the fact that during the day, while volition is present, the slight irritation is either disregarded or inhibited, but when volition is withdrawn during sleep, or as sleep approaches, the excitant is exaggerated and is then sufficient to make the act imperative. Again, if the diseased glands do not interfere with the area of reflex a condition is produced which has been aptly described by Thomson Walker as "the silent prostate." The patient has few complaints and hardly any symptoms, but on investigation prostatic resistance is found to be increased, and there are many ounces of residual urine.

Nocturnal vesical irritation, although commonly associated with retention, does not necessarily imply that it exists; nor does the presence of this irritation negative the contention that "prostatic resistance is generally augmented by enlargement."

A patient complaining of nocturnal frequency and other defects, such as dribbling stream, urgency, and hesitancy, should be subjected to a systematic examination to ascertain the cause of the trouble. The only way of determining the presence of residual urine is by introducing a catheter immediately after the patient has passed all he can by his own efforts. The treatment afterwards is based on the condition found. With adequate precautions the risk of infection is exceedingly small; neither do I agree that a "breakdown" must almost certainly follow instrumentation performed by the patient himself for the purpose of treatment. It will not occur if he is taught to use the instrument properly, and is instructed in the details of an efficient and easy method of sterilization.

Finally, inducing the desire to micturate while the catheter is *in situ* will not produce any back pressure on the kidneys, mainly because the ureteric openings are firmly closed during vesical contraction, unless the disease is advanced and serious structural changes have already taken place, when the treatment would be worse than useless; and secondly, because the presence of the instrument reduces the prostatic resistance sufficiently to enable the muscle to deal with a normal load in a natural way, and at the same time prevents any undue pressure being put on the bladder.—I am, etc.,

London, W., March 30th. HERBERT T. HERRING.

PROSTATIC SYMPTOMS AND THEIR CAUSES.

SIR,—I have been reading with much interest the recent contributions that have appeared in the JOURNAL on the troubles and symptoms of the enlarged prostate, and my interest is largely personal, as I have been for several years a sufferer from these myself. One's attention is naturally specially drawn to one's self when suffering, and occasionally new light may be shed and benefit derived by acting on the knowledge gained by introspection—γνῶθι σεαυτόν. I am therefore glad to submit a few particulars of my own case.

I am 63, wiry, active, and, apart from bladder trouble, enjoying good health. But for ten or more years I have had symptoms usually regarded as entirely due to prostatic enlargement—mild at first, afterwards more pronounced. My prostate is moderately enlarged and elastic to touch. The capacity of the bladder is still up to 10 oz. The symptoms of my trouble are or were: Frequency of micturition, sudden urgency going on to incontinence if opportunity of relieving myself was not available. The stream was usually small and hesitancy in starting it not unusual—that is, some retention. I felt I would have greater relief if I could pass more urine after the flow had ceased. I often had pain at the end of the penis and in the perineum, radiating to adjacent parts of the thighs. Further, I was troubled with a very unusual symptom—namely, priapism. This came on generally during sleep as the bladder filled up, but subsided at once when the bladder was emptied.

Careful consideration of these symptoms has enabled me to realize that the prostatic enlargement, although a contributing factor, was not their main cause. The trouble I found was largely due to avoidable cause or causes, and after these were recognized and corrected I have felt better in every way, although I fear that as they have been operating to my detriment for a number of years unrecognized, permanent harm has resulted. Still, I am very much improved; of that there is no doubt. The reaction of my urine, now normal, had been generally alkaline for a number of years, and this, in conjunction with the symptoms, I regarded as due to residual retention from prostatic enlargement. But now I know this was not the cause of the alkalinity. To explain: I may say I have been troubled with constipation for many years, and, like many others, got into the habit of obtaining relief by taking salines two or three times a week—generally seidlitz powders—with the result that the urine was markedly affected thereby, and became almost constantly alkaline in reaction. These salines, of course, give up their citrates or tartrates and become carbonates and phosphates. I find "phosphaturia" always appears after taking these salines. When such aperients are taken only occasionally no harm is done, as the effect soon passes away, but when taken habitually two or three times a week, as I used to, a marked effect is produced. The sensitive lining of the urinary passages, which in normal conditions is in contact with slightly acid urine, has to submit to the presence of a fluid of unnatural reaction and of irritating character, resulting in a slow inflammatory process, with thickening of the mucous membrane and subjacent tissues, including the prostate, which hypertrophies. Hence the explanation of most of my symptoms—the pain, sudden call, small stream, etc. The lumen of the passage of the urethra is small owing to tumefied mucous membrane and subjacent changes. I may add I have often seen stricture of the urethra, especially near the meatus, in elderly people with prostatic symptoms. As to the priapism, this is not so easily explained. It only appears when cerebral control is cut off, and only then when the bladder is distended. Priapism is seen occasionally in the newly born child and may last for weeks, causing distress to mother as well as child, and afterwards cease to trouble. Where death of the infant has occurred from other causes and a *post-mortem* examination made the only pathological finding in the genito-urinary system has been a deposit of uric acid concretions on the apices of the pyramids of the kidney—the so-called infarcts. What the association of these is with priapism, if any, I will not attempt to say. As to the causation of the symptom in my case it may be reasonable to infer that some similar process has been at work; it may be that deposits of uric acid or of alkaline salts, or both of these, was the cause of the trouble, but this is mere surmise. I should say I have no symptoms of tabes or other spinal cord disease.

I have been anxious to give the history of my troubles to your readers after reading the articles you have recently published, as it is likely that many other sufferers from what is usually regarded as simple prostatic enlargement are unconsciously responsible for their production.—I am, etc.,

March 27th. SENECTUS.

ANGIO-NEUROTIC OEDEMA.

SIR,—Dr. Davis (p. 480) thinks me unduly pessimistic with regard to prognosis, but the impression I wished to give was that the tendency always remains, and that therefore recurrences are the rule, but they are apt to assume an attenuated form, so that to this extent Dr. Davis may take heart. In my experience, in the large majority of cases, the first series of invasions are the most severe, and of the most serious variety; for instance, those few cases I have seen in which the larynx has been involved have invariably occurred in the period of first invasion, recurrences of the disorder having been distributed in the superficial loose cellular tissues. The same remark applies to affection of the tongue. The first attack was by far the worst, subsequent attacks involving small areas only. Extremely uncomfortable, not to say painful, symptoms accompany the disease in its internal manifestations. A surgeon once told me that twice he began to operate upon patients for acute appendicitis only to find that angio-neurotic oedema of the gut was entirely responsible for the symptoms. When the oesophagus is implicated the condition is one of the utmost discomfort, and is apt to create alarm. It is remarkable that sometimes a series of cases occurs in which the mouth and throat are almost exclusively involved, and another series in which the subcutaneous tissue is attacked. There appears to be no reason for this beyond the relative

susceptibility of the patient. In those liable to angio-neurotic oedema the presence of a fly, or even of a particle of dust, in the eye will at once bring on the trouble.

If Dr. Davis will read Dr. Francis Hare's article upon the "Paroxysmal neuroses," in the February number of the *Practitioner*, 1906, he will probably find much help in its application to this condition. Dr. Edgeworth of Bristol has also contributed an interesting paper upon the subject (*Quarterly Journal of Medicine*, January, 1909, vol. 2, No. 6), and in a memorandum to the *Lancet*, June 2nd, 1906, I have tried to point out how Dr. Hare's remarks apply to the disorder, and, in view of my subsequent experience, I am more than ever convinced that the failure of the decarbonizing functions is chiefly responsible. Many incomplete cases occur, and are apt to be overlooked, so that, possibly, the disease is not so rare as is generally supposed.

I believe it is a well-known fact that an access of pyrexia banishes epileptic fits for a time. I have observed precisely the same incident in the course of angio-neurotic oedema. This may point to a relation between the two, or simply to a common origin in variations in carbonaceous income and expenditure with differing results. If, however, both diseases were found to be more closely related than is apparent, we might have to modify our point of view in the treatment of the major disease.—I am, etc.,

Exeter, March 29th. CLAUDE A. P. TRUMAN.

GLANDULAR FEVER.

SIR,—The account of glandular fever in your issue of March 26th, p. 452, is interesting. It seems to be a very definite disease with well-marked clinical features. I have lately had a case in my own family.

The patient, a boy aged 4½ years, was strong and healthy up to a little time before Christmas, 1920, when he began to look pale and appeared out of sorts, and complained of easily getting tired. About January 16th he looked flushed in the evening, but no temperature developed. The same thing occurred the next evening. On the next morning his temperature was 100.4°, and he had some headache and he remained in bed. Next day the temperature rose to 101.4°, when a swelling was noticed under the middle of the right sterno-mastoid muscle, and he complained of pain on moving his neck. A patchy erythematous rash developed, chiefly over the shins, and one or two patches on the arms, face and body. This lasted three or four days. The nose bled rather profusely once. The glands on the left side under the sterno-mastoid then swelled up, but not so markedly as on the right side. The temperature ranged between 101° and 103°, but came down fairly rapidly to normal about the tenth day. During the illness constipation was rather marked. The pulse seemed quick, out of all proportion to the temperature, going up to 150 at the height of the fever, and being very irregular in force and rhythm, and the child looked and seemed very ill. Examination of the throat showed redness of the fauces but no enlargement of the tonsils. Unfortunately a swab was not obtainable, as the child resented having his mouth opened. The swelling of the glands lasted about ten days.

After the temperature had come down to normal the child was kept in bed a further ten days and on a sofa for a further fortnight, until the heart had settled down. Examination of the heart did not show any signs of dilatation, so the rapid pulse was probably due to a toxaemia.

Treatment consisted of glycerin and belladonna to the glands and a febrifuge mixture at first, followed by quinine and small doses of digitalis and strychnine. During convalescence cod-liver oil and malt and Parrish's food were given.

The child now looks well, but care is still exercised that he does not do too much. His brother, aged 6½ years, was in and out of his room during the illness, but did not develop anything, so possibly the disease is not very infectious.

For some time before the illness I had attended several cases of adenitis in children, but they were of the ordinary type, with sore throats and infection of the glands of the anterior triangle.

The theory that the infection may be a type of influenza may have something in it, for shortly after his illness a very widespread outbreak of influenza, beginning amongst the elementary school children, developed here and is still going on, and a large number of cases of bronchopneumonia have occurred.—I am, etc.,

Chichester, March 28th. WALTER DICK.

THE Swedish Government has allotted 5,000 crowns to the Swedish Medical Association to help in the printing of the three scientific journals published by the association.

Universities and Colleges.

UNIVERSITY OF LONDON.

A MEETING of the Senate was held on March 16th.

The title of Professor of Surgery of the University was conferred upon Mr. G. E. Gask (St. Bartholomew's Hospital) and the status and designation of appointed teacher were conferred upon Dr. T. R. Elliott, Professor of Medicine in the University. Dr. John A. Ryle was recognized as a teacher of medicine at Guy's Hospital Medical School.

The Royal Dental Hospital and London School of Dental Surgery and the National Dental Hospital and College, forming a department of University College Hospital Medical School, were continued as schools of the University (in dentistry only) for a period of one year, from January, 1921.

Professor A. D. Waller, F.R.S., was reappointed Director, and Dr. T. D. Lister, C.B.E., Treasurer of the Physiological Laboratory until the end of the session 1920–21.

It was resolved that the revised syllabus in pharmacology of of the second examination for medical degrees, Part II (Red Book, 1920–21, pp. 247–9, and Blue Book, September, 1920, pp. 229–31) be operative in and after the year 1923.

The following were appointed to act as additional examiners in obstetric medicine at the M.B., B.S. examination in May, 1921: Dr. J. S. Fairbairn (St. Thomas's Hospital), Dr. T. G. Stevens (St. Mary's Hospital), or, failing either of these, Dr. E. Holland (London Hospital) or Lady Barrett, C.B.E. (Royal Free Hospital).

Mr. H. J. Waring has been reappointed by the Faculty of Medicine a member of the Senate for 1921–25.

Applications for the Jodrell Chair of Zoology and Comparative Anatomy tenable at University College (salary £800 a year) and the Chair of Anatomy tenable at St. Bartholomew's Hospital (salary £900 a year) must be received by the Academic Registrar by April 25th and April 14th respectively. Applications for a University Studentship in Physiology (£50 for one year) must be received by the Principal Officer, from whom full particulars can be obtained, by May 31st.

Course in Mental Deficiency.

A course of lectures on mental deficiency, arranged by the University Extension Board in co-operation with the Central Association for the Care of the Mentally Defective, will begin at the University of London, South Kensington, on Monday, May 23rd, and terminate on June 4th. It meets the requirements of the syllabus for the diploma of the University in psychological medicine. The course will consist of eleven lectures, with clinical demonstrations, on mental deficiency by Dr. A. F. Tredgold and five by Dr. F. C. Shrubsall on administrative procedure in the ascertainment and treatment of the mentally defective, supplemented by lectures on the psychology of mentally defectives by Mr. Cyril Burt; on methods of training mentally defective children by Miss Lucy Fildes, on psychoneuroses in relation to mental deficiency by Dr. Eric Prideaux, and on the relation between crime and mental defect by Dr. W. C. Sullivan, medical superintendent of the Criminal Lunatic Asylum, Broadmoor. Further particulars can be obtained on application to Miss Evelyn Fox, at the University of London, Imperial Institute Road, South Kensington, S.W.7.

GUY'S HOSPITAL.

Dental Research Fellowship.

A Dental Research Fellowship Fund has been instituted, consisting of a sum of money not exceeding £300 per annum, awarded wholly or in part. Applicants, whether graduates or undergraduates, must have studied in the Medical School or Dental School of Guy's Hospital, unless the advisory body decides that the circumstances are exceptional. Holders of grants from the fund may, at the discretion of the advisory body, be part-time research workers. All research work undertaken with the aid of the fund must be entirely carried out in Guy's Hospital or the schools attached thereto, unless the advisory body agrees that, from the nature of the work, some portion of the study might with advantage be pursued elsewhere. Applications for grants from the fund should be made to the Clinical Research Committee of Guy's Hospital, London Bridge, S.E.1.

UNIVERSITY OF DURHAM.

AT the Convocation held on March 26th the following degrees were conferred:

M.D. (*for Practitioners of Fifteen Years' Standing*).—C. Corfield, R. J. C. Thompson.
M.S.—J. A. Berry, W. A. Hewitson, N. Hodgson.
M.B., B.S.—J. S. Clark, R. C. Davison, T. W. K. Dunscombe, Norah H. Hamilton, R. T. E. Naismith, J. D. Silverston, T. S. Severs, H. Toma, R. P. Wanless.
B.S.—Margaret B. Herbst.
B.HY. AND D.P.H.—W. L. Glegg.

UNIVERSITY OF EDINBURGH.

Department of Physiology.

THERE is a vacancy for an assistant in this department. Applications, with full information as to qualifications and previous work, should be addressed to Professor Sir E. Sharpey Schafer, from whom particulars of salary, nature of work, etc., may be obtained.

UNIVERSITY OF ABERDEEN.

A GRADUATION ceremonial was held on March 31st, when the following medical degrees were conferred:

M.D.—J. B. Milne.

M.B., CH.B.—*†J. Craig, *† Eleanora M. P. Law, *†D. R. Macdonald, *†Mary M. Pyper, †I. R. Spark, C. D. Allan, J. J. H. Anderson, *N. C. Bodenstein, F. K. Chen, Lilian F. Gall, R. K. Grant, G. G. W. Hay, Margaret Lipp, *M. H. Logg, A. MacKay, Elsie Mackie, Katharina F. E. van der Merwe, Mary G. Milne, Dorothy Mitchell, J. I. Moir, Marion E. Mowat, Isabella M. H. Murray, *Janet C. Nicol, A. E. Reid, E. N. D. Repper, *J. P. J. Rossouw, G. Saint, N. C. Simpson, Ethel V. G. Smith, *A. L. G. Thomson, I. S. Thomson, A. R. Wood.

D.P.H.—D. W. Berry, A. M. Dugan, F. A. Innes, H. R. Neilson, W. W. Nicol, J. A. Sellar, Agnes L. Semple.

* Passed Final Medical Professional Examination with distinction.
† With second-class honours.

UNIVERSITY OF GLASGOW.

THE following candidates have been approved at the examinations indicated:

M.B., CH.B. (*Medical Jurisprudence and Public Health*).—M. Brown, J. I. Cameron, J. A. Cameron, A. J. G. Caporn, W. Houston, T. J. Jones, *D. Lamont, A. Logan, G. H. Macartney, W. M. M'Cash, J. W. M'Conville, F. M'Elwee, C. F. H. M'Fadyen, J. J. M'Ghee, T. J. M'Kail, E. J. MacPhail, W. B. M'Queen, R. S. V. Marshall, W. Muir, A. Snaddon, J. Sneddon, W. A. M'E. Stewart, H. V. Sweeney, D. M. Thompson, E. J. T. Thompson, A. F. White, A. Wilson, Marion C. Boyd, Mary D. A. Boyd, Jemima G. Brodie, Margaret G. Carrick, Katharine L. Couper, Elizabeth Coupland, Isabella C. Darling, Martha D. Devon, Jean M. Gilchrist, Mary D. Gilmour, Annie W. Humble, Frances B. C. Livingston, Joan A. MacColl, Henrietta L. Paterson, Joanna T. Rae, Jessie G. Service, Jeanie M. Strathie, Eleanor M. Torrance, Adeline G. Vallance. *Old Regulations:* Francisco Ribeiro.

* With distinction.

UNIVERSITY OF DUBLIN.

TRINITY COLLEGE.

THE following candidates have been approved at the examinations indicated:

FINAL M.B.: PART I.—*Materia Medica and Therapeutics, Jurisprudence and Hygiene, Pathology and Bacteriology:* *L. Stazunsky, *A. E. Drotske, *F. C. B. L. B. Crawford, D. S. Spence, J. V. Carroll, R. A. O'Meara, Minnie Alper, R. Seale, Charlotte A. Stuart, J. D. Watson, F. B. D'Arcy, Ruth Lemon, C. W. R. McCaldin, F. Malone-Barrett, P. H. S. Fouche, J. E. Deane, J. O'Connor, H. J. L. Murphy, M. Sayers, J. G. Russell, D. H. Saayman, Dorothy C. H. Dorman, Muriel V. Odlum, Mary H. Harcourt, L. Phillips, I. P. Myers, J. C. Byrne. *Materia Medica and Therapeutics, Jurisprudence and Hygiene:* H. Hall, W. T. Hogan. *Jurisprudence and Hygiene, Pathology and Bacteriology:* R. N. Perrott. *Pathology and Bacteriology:* A. G. Bewley, N. McI. Falkiner, A. E. Phillips, G. S. Moran, H. L. Hanna, H. C. Dundon, J. J. P. Kelly, J. Devane.

PART II.—*Medicine:* J. A. Smith, D. J. Browne, R. H. J. M. Corbet, T. F. L. Cary, Elinor D. Stopford, H. C. C. Deane, Edith F. Willock, F. Y. Pratt, R. H. Satchwell, Dorothy A. Daly, C. S. Wilson, E. S. Horgan, Ruth F. Flavelle, D. V. Latham, R. S. Chapman, J. A. Acheson, P. M. J. Bobbett, R. W. Power, T. W. Panter, J. D. Leahy, J. C. Davis, A. D. Ward, P. J. Healy, G. C. B. Robinson. *Surgery:* *E. C. Smith, D. de Bruijn, R. V. Dowse, J. D. Leahy, H. C. C. Deane, W. H. Smith, Margaretta T. Stevenson, Dorothy A. Daly, L. Herzenberg, R. S. Chapman, P. I. Levitt, G. C. Malherbe, P. J. Healy, C. W. Parr, J. A. Acheson, J. C. Brennan, F. M. Hilliard, Alida C. Burt, E. G. Campbell, Mary Horan, R. H. Satchwell. *Midwifery:* *A. D. Ward, *E. R. Murray, *R H. J. M. Corbet, *M. R. Coolican, *Nannette Norris, A. H. N. Todd, L. Herzenberg, W. A. Murphy, R. Dormer, J. D. Thompson, T. G. Warham, Alida C. Burt, R. S. Chapman, Rita Dillon-Leetch, E S. Horgan.

D.P.H.: PART I.—*Chemistry, Bacteriology, Physics, and Meteorology:* T. J. KilBride, T. P. Chapman, T. D. Gordon, H. Muller.

PART II.—*Sanitary Engineering, Sanitary Inspection and Report, Hygiene, Epidemiology, Vital Statistics, and Public Health Law:* T. J. KilBride, H. Muller, T. P. Chapman, T. D. Gordon, Anna M. K. O'Halloran.

* Passed with high marks.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND.

AT a meeting of the President and Fellows, held on April 1st, the following candidates for the Fellowship of the College, who had been nominated on January 7th, 1921, were duly elected Fellows: Thomas Mather Thomson, Harold Pringle, M.D.

At the same meeting the successful candidates at the recent final examinations under the Conjoint Scheme of the Royal Colleges of Physicians and Surgeons, Ireland, were admitted Licentiates in Medicine and Midwifery of the College as follow: Mary Boland, Lucretia H. H. Byrne, T. Cooney, B. J. Coyne, J. A. Cusack, Edith M. Ll. Dodd, A. C. Esmonde, P. Gaffney, S. A. Gailey, J. W. E. Graham, S. J. Halpin, T. J. Kerr, J. J. McHenry, P. Moylan, J. J. O'Sullivan, J. Tehan (with honours).

DR. CHACÓN, an eminent Spanish toxicologist and professor of obstetrics at the University of Madrid, has recently died.

IN 1919-20 there were 14,088 medical students in the United States; this was an increase of 1,036 over the number in 1918. The number of students who became qualified in 1919-20 was 3,047.

Obituary.

RUTHERFOORD JOHN PYE-SMITH, CH.M., F.R.C.S.,

Emeritus Professor of Surgery, University of Sheffield.

THE death of Mr. Rutherfoord Pye-Smith, which we announced briefly last week, will be felt as a personal loss, not only by the large circle of his friends, but by numbers of people of all ranks of society in Sheffield and district who have benefited by his professional skill or personal acts of kindness and sympathy. He was a worthy representative of a notable Sheffield family. His grandfather, John Pye-Smith, D.D., F.R.S., the eminent divine and geologist, left his native town in 1801 to settle in London; his father, Ebenezer Pye-Smith, F.R.C.S., was an honoured member of the medical profession, and it was in London that Rutherfoord John Pye-Smith was born in 1848. He and his elder brother, Philip Henry Pye-Smith, were educated at Guy's Hospital. The latter was the well known physician of Guy's, and editor of the first (posthumous) edition of Hilton Fagge's *Textbook of Medicine*, and editor and author of the subsequent edition.

Rutherfoord Pye-Smith took the diploma of M.R.C.S. in 1871 and that of L.R.C.P. in 1872; he became F.R.C.S. in 1875, and started practice in Sheffield in 1876. He was elected surgeon to the Sheffield Royal Hospital in 1877, and he devoted himself to the interests of that institution heart and soul. Although hampered by buildings and equipment that were then out of date and inadequate, he introduced Listerian surgery, and gradually effected a great improvement in the efficiency of the hospital on its surgical side. Though utterly incapable of advertising himself, and of a retiring and rather shy temperament, such abilities as his could not long remain unrecognized. He gradually won his way and took rank as one of the leading surgeons of the district. As an operator he was safe rather than brilliant. His technique was exceedingly careful and thorough, and his operative results were very good. As a clinician the accuracy of his observation and soundness of judgement were rarely at fault. He always kept in touch with the developments of surgery. One of the secrets of the success of his surgical work was that he was always hopeful and resourceful, however grave the case might appear. The amount of work he accomplished was extraordinary. His whole days were an unremitting round of toil, and a large part of the nights was spent in correspondence and literary labours. Everything he undertook was accomplished with untiring attention to the minutest detail. His activities included not only professional matters but various forms of social service, philanthropic and Church work, and in these he was much helped by the devoted assistance of his wife. He was never a rapid worker, and it was only by constant effort and exacting toil that he was able to get through the day's work and to satisfy his passion for accuracy and thoroughness.

After his retirement from the Royal Hospital staff in 1908, at the age of 60, he retained a large surgical consulting practice. He had been President of the Yorkshire Branch of the British Medical Association, and his Address in Surgery at the annual meeting of the Association in Sheffield in 1908 will be remembered by those who heard it as full of shrewd observation, mature wisdom, and humour. From the University of Sheffield he received the degree of Ch.M. in 1908; he was professor of surgery in that university, and represented it on the General Medical Council from 1911 to 1919.

In the strenuous days of the war his knowledge and skill were needed for the treatment of the sick and wounded. Though almost worn out by thirty-five years of incessant work and in poor health, he responded to the call and joined the staff of the Wharncliffe War Hospital. The younger surgeons who were his colleagues at that hospital know well the value of the work he did there, as did his patients, by whom he was known as the saviour of limbs. But the strain proved too much for his years and a constitution never robust, and, though he continued to do valuable service until the end of the war, he was forced to yield to the remonstrances of his friends and to restrict the range of his activities.

When the strain of the war was over there was no hiding the fact that his health was very seriously under-

mined, though he would never consider himself an invalid. The restful life of his country home at Ampthill did something to restore his health; but the weakness remained, and he succumbed to heart failure following influenza after a brief illness of two days. His name must be added to the long list of veterans who sacrificed their lives by devotion to duty during the war.

His most striking characteristics, which endeared him to a large circle of friends, were a transparent sincerity in all he did and said, and a beautiful serenity of disposition. No one ever saw him ruffled or impatient. In all difficulties or controversies he was ready to act as mediator or to effect a compromise.

No notice of Rutherfoord Pye-Smith can be complete without reference to his religion. His piety was entirely without aggressiveness, but no one who came in contact with him could doubt its sincerity and the influence exerted by religion on his every act and thought. It was manifest in his consideration for others, his modesty, his kindliness and in his large-minded and large-hearted charity. His patients all loved him, and to few can it be given to inspire such entire confidence as he did. His memory will be gratefully cherished by numbers of people of all conditions.

ROBERT MURRAY LESLIE, M.A., M.D.EDIN., M.R.C.P.LOND.,

Physician to the Prince of Wales's Hospital, Tottenham, and the Royal Hospital for Diseases of the Chest.

THE death, announced in our last issue, at the comparatively early age of 55, of Dr. R. Murray Leslie, will be keenly regretted by a wide circle of friends, medical and lay. It was unexpected, though for the past few months he had been in failing health.

Robert Murray Leslie came of an old Scottish Highland family, being the son of the late Alexander Leslie, J.P., of Suddie, Munlochy, Ross-shire, and one of six brothers, four of whom became members of the medical profession. He received his schooling at George Watson's College, from which he passed to the University of Edinburgh, where he graduated M.A. in 1888, B.Sc. in 1889, and M.B. and C.M. in 1892—all with first-class honours. In science and in medicine he was the most distinguished graduate of his year, being awarded the Baxter and the Ettles Scholarships in these faculties respectively, and the University medal in medicine and obstetric medicine. After graduation he became house-physician to the late Sir Thomas Grainger Stewart at the Edinburgh Royal Infirmary, and, while Stark Scholar in clinical medicine, worked in the laboratory of the late Professor Greenfield, to whom he for a short time acted as assistant in the pathological department of the university. Soon afterwards he came to London, where he held many hospital and other medical posts, including a house-physicianship at Brompton and the senior medical registrarship at King's College Hospital. He became a member of the Royal College of Physicians of London in 1893, and in the following year was appointed assistant physician to the Royal Hospital for Diseases of the Chest. During his long connexion with the Prince of Wales's General Hospital at Tottenham he served also as lecturer in medicine at the North-East London Post-graduate College. His other activities included the chairmanship of Council of the Women's Imperial Health Association of Great Britain; he was an officer of the French Academy.

A colleague—"W. E. C. D."—writes: "At the time of his death Dr. Murray Leslie was senior physician to the Prince of Wales's Hospital, and had just resigned a similar position at the Royal Chest Hospital, City Road, the amalgamation of which with another hospital and the consequent loss of its traditions and identity as the oldest hospital for diseases of the chest in the world he keenly regretted. In the course of his career he made many contributions to medical literature, and had just completed a volume on *Pneumonia and its Modern Treatment* for Oxford Medical Press. He was widely recognized as a consultant upon diseases of the chest, and patients were sent to him for advice from all parts of the kingdom. Many of his brother practitioners and their patients and all of his hospital colleagues will miss his kindly, loyal, and generous personality. His services were ever freely at their disposal, as well as at that of members of the nursing profession, in the welfare of which he took a deep and active interest. A few years ago Dr. Murray Leslie founded a medal in Edinburgh University, in honour of his mother, the idea being suggested by the fact that, of four of her sons who were members of the medical profession, three were graduates in medicine of the university."

Only last year Dr. Murray Leslie married Gwladys Olive, daughter of Captain Knox Keith, R.N., with whom deep sympathy is felt.

WE regret to record the death of Dr. GEORGE PHILLIP FRANCIS of Brecon, which took place on February 28th, after a protracted illness, at the age of 65 years. The son of the late Mr. Charles Francis of Venny-Fach, near Brecon, he was educated at St. Thomas's Hospital, and after qualifying in 1879 held a resident appointment at the City of London Hospital for Diseases of the Chest. He then went into private practice in Boston, Dorset, where he remained for some seven years, and in 1886 he bought an old-established practice in Brecon, South Wales, where he subsequently led a busy and successful life. He was honorary surgeon to the Brecon Infirmary, and held many other medical posts in the district. A member of the Brecon Town Council for some years he twice served as mayor, and, like his father before him, he was a justice of the peace for the borough and county. He was an ardent Freemason, a stalwart Conservative, and a keen member of the British Medical Association, having attended the annual meetings ever since he qualified. Dr. Francis was a man of varied interests, perhaps more fond of a good horse than of anything else, and he was well known as a breeder and exhibitor of Welsh cobs and hackneys. On many occasions he won first prizes at the principal horse shows in England and Wales, including a first at the London Hackney Show, for the best pair in a class open to the world, with the celebrated "Lady Dandy" and "Royalty." The strain of the extra work which he undertook during the war brought on acute dilatation of the heart early in 1919, and, although he resumed work some months later, he never quite recovered. He is survived by three sons, the second of whom, Captain Cyril Francis, R.A.M.C., is at present serving with the Army of Occupation in Germany.

Dr. CHARLES WEBB ILIFFE, coroner for Coventry and North Warwickshire, died on March 1st in his 77th year. He received his early education at the old Grammar School at Coventry, and subsequently studied for the medical profession at Middlesex Hospital. He took the diplomas of L.R.C.P.Edin. and M.R.C.S.Eng. in 1865. He was appointed coroner in 1879. For sixteen years he was surgeon to the Coventry and Warwickshire Hospital, afterwards becoming honorary consulting surgeon. Last year he was appointed a Justice of the Peace for the City of Coventry.

The Services.

HONOURS.

TERRITORIAL DECORATION.

THE KING has conferred the Territorial Decoration upon the following medical officers:—*Army Medical Service:* Colonel Alexander D. Sharp, C.B., C.M.G. *Royal Army Medical Corps:* Lieut.-Colonel Thomas Donovan, 1st Welsh Field Ambulance; Lieut.-Colonel Alexander Callam, D.S.O., 2nd East Lancashire Field Ambulance; Lieut.-Colonel Richard W. Brimacombe, Home Counties Casualty Clearing Station (ret.); Major Leonard A. Avery, D.S.O., D.A.D.M.S., 54th (East Anglian) Division; Major John Owen, attached Lancashire Fortress R.E.; Major George Mackie, D.S.O., 1st South Midland Field Ambulance; Major Walter G. Paget, attached 4th Battalion The Queen's Regiment; Major Charles A. Spooner, 2nd London Sanitary Company.

DEATHS IN THE SERVICES.

DEPUTY INSPECTOR-GENERAL NICHOLAS THOMAS CONNOLLY, LL.D., R.N. (retired), died at St. Jean de Luz, France, on February 10th, aged 82. He took the L.R.C.S.I. in 1860, and, entering the navy soon after, became fleet surgeon on September 25th, 1883, and retired with the honorary rank of D.I.G. on February 11th, 1894. He served in East Africa in the campaign at Vitu in 1890, receiving the medal with a clasp.

Lieut.-Colonel Edgar Beer Russell, Bengal Medical Service (retired), died on November 8th, the day after attaining the age of 72. He was the son of the late Rev. Edward Russell Wesleyan Church, of Bloxwich, Staffordshire, was educated a

Guy's, and took the diplomas of L.S.A. in 1870 and M.R.C.S. in 1872, also graduating as B.Sc., with honours, and M.B., in 1872, at London University. Entering the I.M.S. as assistant surgeon on March 30th, 1872, he became surgeon lieutenant-colonel after twenty years' service, and retired on August 27th, 1900. Almost the whole of his service was spent in civil employment, first in Assam and afterwards in Bengal, where, after various less important civil surgeoncies, he held the same post successively at Patna, 1890–92, Darjiling, 1892–94, and Dabha, 1894–96. In September, 1896, he was appointed professor of materia medica in the Calcutta Medical College, and second physician to the college hospital, holding the chair till his retirement. He was the author of a work on *Malaria and the Spleen*, published in 1880.

Medical News.

THE annual general meeting and dinner of the Cambridge Graduates' Medical Club will be held on Thursday, April 21st, at the Imperial Restaurant (Oddenino's), Regent Street, London, W., at 7.30 o'clock, with the President, Sir Humphry Rolleston, K.C.B., in the chair. Price of dinner, 12s. 6d., exclusive of wine. The honorary secretaries are Mr. R. Davies-Colley, C.M.G., 10, Devonshire Place, W.1, and Mr. W. H. C. Romanis, 8, Harley Street, W.1.

A MEETING of the Society of Medical Officers of Maternity and Child Welfare Centres will be held on Friday, April 15th, at 5.30 p.m., in the Central Committee Room, University College, Gower Street, London, W.C., when a paper will be read by Dr. Marion Cockerell entitled "Infant feeding after the ninth month." A discussion will follow. Members are invited to bring friends, provided that they are medical officers of centres.

MEMBERS of the medical boards, the medical referees and the medical staff of the Ministry of Pensions in the Ireland South Region, entertained Dr. D. A. Carruthers at luncheon on the occasion of his departure from the Region. He has held the position of Commissioner of Medical Services for the past two years. About forty members of the medical profession engaged in the various branches of work in the Ministry of Pensions in the Region were present. Drs. C. R. Kilkelly (in the chair), T. E. Rainsford, H. B. Beatty and R. J. Rowlette each expressed the esteem in which Dr. Carruthers was held by the various departments over whose work he has presided, and referred to the invariable courtesy and consideration displayed by him towards all sections of the medical profession who came into contact with him. A presentation and address subscribed by seventy medical men was made in token of the universal regret felt on the departure of Dr. Carruthers from Ireland, and of the good wishes for his future prosperity in his new sphere of work in England. A presentation has also been made to Dr. Carruthers on behalf of the clerical staff of the Medical Services Branch.

A MEETING of the Harveian Society will be held at the Town Hall, Harrow Road, Paddington, on Thursday, April 14th, at 8.30 p.m., when Mr. Duncan Fitzwilliams, F.R.C.S., will read a paper on "The naevi of children and their treatment."

A SPECIAL course of instruction in venereal diseases for post-graduates and students will be given at the London Lock Hospitals commencing on April 18th and terminating on May 10th. The course consists of clinics daily and twenty-five lectures, three of which will be given at the Female Hospital, Harrow Road, and the remainder at the Male Hospital, Dean Street, W. The fee for the complete course is 4 guineas. Applications for tickets should be made to the Secretary at the Hospital, 283, Harrow Road, W.9.

ON March 29th Dr. John Jeffrey of Jedburgh was presented by his patients and friends with an illuminated address and three valuable pieces of Georgian silver on the occasion of his leaving the town to take up an appointment at Aberdeen under the Ministry of Health.

THE annual meeting of the Chartered Society of Massage and Medical Gymnastics will be held on Saturday, April 16th, at 3 p.m., at the Armitage Hall, 224, Great Portland Street, W.1. The chair will be taken by Sir E. Cooper Perry, M.D.

A POST-GRADUATE course in hydrology, radiology, and physical therapy lasting for two months will be held in the course of the year at Naples. Particulars may be obtained from Professor Pio Marfori, Sant' Andrea delle Dame 21, Naples.

THE late Sir John W. Byers, Professor of Midwifery in Queen's University, Belfast, left £51,068.

DR. A. T. NANKIVELL, on his retirement from the posts of medical officer of health and school medical officer for Poole, has been presented by the staffs of the health and education departments and of the Alderney Isolation Hospital with an inscribed clock, as a mark of their esteem and respect.

AT the meeting of the Medico-Legal Society, to be held at 11, Chandos Street, W.1, on Tuesday, April 19th, at 8.30 p.m., a paper will be read by Mr. W. G. H. Cook, LL.D., on "The liability of the insane in respect of civil wrongs."

THE King has appointed Colonel Sir Edward Scott Worthington, K.C.V.O., C.B., C.M.G., to be a Companion of the Order of the Indian Empire, for services rendered in connexion with the visit of H.R.H. the Duke of Connaught to India.

A SPECIAL course on the pathology and clinical aspects of tuberculosis will be held at Genoa from April 18th to May 21st. Admission to the course can be obtained on application to the Secretary of the Medical Clinic, Via Balilla 5, Genoa.

THE Coroner for the City of London, Dr. F. J. Waldo, held, during the year 1920, 599 inquiries in the City of London, including H.M. Prison at Holloway and the borough of Southwark. With the exception of a few natural deaths juries were summoned in all cases, Dr. Waldo holding that an intelligent jury, directed by a coroner, is a more satisfactory tribunal for the elucidation of truth than a coroner sitting alone. An inquest was held on the body of only one infant accidentally suffocated whilst in bed with its parents—the lowest figure ever recorded. The marked general decrease throughout England and Wales during the past few years in this class of preventable death is, Dr. Waldo thinks, due chiefly to the more general use of cots and cradles, and the holding of more autopsies by which the actual cause of death is ascertained. Inquests were held in only eight cases in which sudden death was accelerated by the administration of anaesthetics for surgical operations. Of this number, three died in the City and five in Southwark.

Letters, Notes, and Answers.

As, owing to printing difficulties, the JOURNAL *must be sent to press earlier than hitherto, it is essential that communications intended for the current issue should be received by the first post on Tuesday, and lengthy documents on Monday.*

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London*; telephone, 2630, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London*; telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Medisecra, Westrand, London*; telephone, 2630, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin*: telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh*; telephone, 4361, Central).

QUERIES AND ANSWERS.

INCOME TAX.

"X." asks: Should a medical man who retired from practice in September, 1917, be assessed on a three years' average for 1920–21, seeing that since retiring he has done only a little locumtenent work?

*** No. If "X." had retired from medical work altogether he would not have been assessable at all for 1918–19 or following years. If he sold his practice his successor was liable to account for tax on the full profits of the tax from September, 1917, onwards, and no doubt did so. In any case, however, it seems clear that from that time our correspondent's income tax liability ceased to have any reference to the profits of his former practice, and that a new basis of liability was set up when he commenced locumtenent work.

"COLONIAL" inquires as to deductions for (1) "the primary cost of necessary instruments, etc.," and (2) "part of the rent of a house a room of which is occasionally used for work."

*** (1) The cost of the primary or original equipment cannot be deducted; that cost represents an outlay of capital and only expenditure incurred to *maintain* the equipment is deductible. (2) "Colonial" can deduct a reasonable proportion of the rent he pays; what that proportion would be would, of course, depend on the particular circumstances.

"T. M. P." is selling a 1919 Ford car and a 1920 motor cycle for £275 and purchasing a new car for £600. He inquires whether he can claim an allowance of the difference.

*** As an expense of renewing his means of locomotion our correspondent is entitled to a deduction equivalent to the excess over £275 of the cost price, as on the day he purchased the £600 car, of a 1919 Ford and a 1920 motor cycle of similar make and power.

"BASUTOLAND" inquires what would be the position if his wife came to reside in England.

*** She would be liable to account for tax—after deduction of £225 and the allowances for children—on (*a*) her own income and (*b*) such portion of our correspondent's income from property (not from earnings) as he remitted to this country. In any financial year in which he is in this country, he would have to account for tax on one-third of the amount of the remittances made by him from *earnings* in the previous three years. The rates of tax are 3s. in the £ on the first £225 of taxable income and 6s. in the £ on the balance.

PAIN IN THE SHINS.

"W. M. J." desires suggestions for the diagnosis and treatment of a case under his care. The patient is a man of 55, who has suffered on and off for some twenty years past from aching pain in the shins at the junction of the tendinous and muscular portions of the exterior muscles of the leg. The pain usually comes on in one leg or the other after three or four hours in bed and awakens him from sleep. The skin over the affected area is cold to the touch. The patient is sparely built, but appears healthy and complains of nothing else. He takes a fair amount of walking exercise, wearing heavy boots and leggings. There is unquestionably no history of syphilis. I supposed that the condition was due to digestive disturbances and particularly to the use of acid fruit, etc., but am not clear if this is the case.

LETTERS, NOTES, ETC.

TRANSFIXION OF THE BODY.

DR. S. D. CLIPPINGDALE (London, W.) writes: The remarkable case now in Charing Cross Hospital—a man whose body was transfixed by a long metal rod (cleverly removed with the help of Mr. Venables, the hospital engineer)—is not without historic precedent. In the *London Hospital Gazette* for March, 1913, in a memoir of Sir William Blizard, I referred to a similar case which occurred about a century ago. A gentleman drove in a one-horse chaise from his office in the city to his home in Stratford. On arriving he found his groom absent, and had to unharness the horse himself. The horse, resenting the attention of a person to whose services he was not accustomed, became restive and impaled his owner to the stable door by driving one shaft of the chaise right through the chest. The local doctor, Mr. William Maiden, M.R.C.S., called in, sent for Sir William Blizard. Sir William, who practised long before the days of antiseptic surgery, was well aware of the danger of admitting atmospheric air into wounds, and advised the local surgeon to content himself with sawing off the projecting ends of the impaled shaft, and not attempt to remove it. This was done. The patient lived twelve years, and in gratitude for the action, or rather inaction, of his surgeon bequeathed his thorax with the shaft in it to the Museum of the Royal College of Surgeons. In the library of the college is a full account of the case by Mr. Maiden.

PUERPERAL INFECTION.

"M.D." (Lancs.) writes: It is a remarkable fact that when I get infection in any of my cases a certified midwife has invariably been in attendance; when the case has been attended by a woman neighbour the cases do well. Why is this? A midwife makes at least one examination, if not more; a neighbour does not make any. I find also that it is common for midwives to have patients with mild degrees of septicaemia, who recover without medical assistance. They hesitate to call in a doctor for two reasons: (1) It might convey to the minds of the relatives the midwife's incompetence, and (2) they dread a notification of puerperal fever. If the inspector of midwives would pay surprise visits and take the temperatures of all cases on the list of a midwife he or she would sometimes receive a shock.

ERADICATION OF TUBERCULOSIS IN MAN AND ANIMALS.

DR. A. A. WARDEN (Paris), in the course of a letter on the report of the combined meeting of the Royal Society of Medicine and the Central Branch of the National Veterinary Medical Association published in our issue of March 19th, writes: From Sir John McFadyean's remarks (p. 422) I gather that the eradication of tuberculosis from cattle would reduce to a vanishing point tuberculosis in other domesticated species, and appreciably reduce the incidence of tuberculosis in man, seeing that (Dr. A. C. Inman, p. 423) 18.7 per cent. of all cases are bovine infections and 85.7 per cent. of cases in children under five are of bovine origin. Sir John goes on to say that the eradication of tuberculosis would involve the slaughter of 750,000 cows or heifers, and that no Government would find the money to compensate for such a slaughter and the consequent diminution of the supply of (tuberculous?) milk. Rounding off the above figures a little, we may say, without undue exaggeration, that 25 per cent. of the tuberculosis in Great Britain is due to tuberculous cows and could be eradicated by their slaughter. Averaging the tuberculous cow or heifer at £10, we may conclude that, for lack of £7,500,000, one-quarter of that section of our population now doomed to tubercle, some 25,000 lives, mostly of infants, must be sacrificed, will be sacrificed this year, next year, every year. Easily satisfied, indeed, must we be if we accept Sir Clifford Allbutt's cold and paradoxical comfort that, after all, tuberculosis has brought us benefits in its train, and that our hope must lie in team work with comparative pathologists, and resign ourselves to his assurance that, in such a struggle, the public would bestow a relatively small sum for investigation and expect results in three months.

SIMULIUM REPTANS IN IRELAND.

DR. NINIAN M. FALKINER, Vice-President R.C.P.I. (Dublin), writes: Some time since I received from the late Dr. Cecil Digby of Knockane (on the banks of the river Laune), co. Kerry, a fly for identification, whose bite, he stated, produced severe inflammatory reactions in man and in animals. I forwarded the insect to Mr. J. H. Halbert, of the entomological department of the National Museum, who identified it as a specimen of *Simulium reptans*, described by Mr. Austen as one of the most dreaded of the blood-sucking Diptera. As the existence of this fly has only been recorded from a few Irish localities, some of which need verification, the foregoing may be of interest to your readers.

AN ACID DENTIFRICE.

DR. H. W. COLLIER (London, E.C.) writes to express his agreement with Dr. W. J. Henson's letter in the JOURNAL of March 12th, p. 408, regarding the injurious effects of the various alkaline dentrifices now in the market and the advantages of a fruit-acid toothpaste.

A DISCLAIMER.

WE have received a note from Dr. R. L. Mackenzie Wallis and Dr. C. Langton Hewer stating that articles which have recently appeared in the lay press, purporting to be abstracts of a paper recently read by them at the Royal Society of Medicine on a new anaesthetic, were published entirely without their knowledge and permission.

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 31, 34, 35, 36, and 37 of our advertisement columns, and advertisements as to partnerships, assistantships, and locum tenencies at pages 32 and 33.

THE followlng vacant appointments of certifying factory surgeons are announced: Catwick (York, East Riding), Duntocher (Dumbarton), Eastbourne (Sussex), Sedgeley (Stafford), Sherborne (Dorset), Stanford le Hope (Essex).

WE have received from Messrs. Watson and Sons (Electro-Medical), Limited, the latest issue of their *Sunic Record*, which contains a useful chart and table of spark-gap voltages, and also a bulletin on the use of duplitized film—that is, an *x*-ray film which has an emulsion coated on both sides—and its manner of development. This firm has lately placed on the market a new *x*-ray plate in which an intensifying-screen material is combined with the emulsion so as greatly to reduce exposures.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

	£	s.	d.
Six lines and under	0	9	0
Each additional line...	0	1	6
Whole single column (three columns to page)	7	10	0
Half single column	3	15	0
Half page	10	0	0
Whole page	20	0	0

An average line contains six words.

All remittances by Post Office Orders must be made payable to the British Medical Association at the General Post Office, London. No responsibility will be accepted for any such remittance not so safeguarded.

Advertisements should be delivered, addressed to the Manager, 429, Strand, London, not later than the first post on Tuesday morning preceding publication, and, if not paid for at the time, should be accompanied by a reference.

NOTE.—It is against the rules of the Post Office to receive *poste restante* letters addressed either in initials or numbers.